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THE BRACHYCEPHALIZATION OF RECENT MANKIND

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THIS STUDY deals with a tragic anthropological error committed in good faith a hundred years ago. Later the error, taken as a reality, has been unscrupulously misused by laymen and scholars alike for purely political propaganda in order to discriminate against entire ethnical groups and nations and to glorify others. It would be a great exaggeration to claim that this primary error is responsible for the world catastrophe in which we are now involved. But there can be little doubt that the ruthlessness and atrocity with which the partisans of the "master-race" theory persecute and annihilate their victims are impelled by a fanatic belief in their own physical and mental superiority. This superiority, they think, can be demonstrated by simple anthropological tests of which the so-called skull index has been considered as one of the most reliable and obvious.

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I BRACHYCEPHALY AND ITS IMPUTED SIGNIFICANCE

About a hundred years ago the Swedish anatomist Anders Retzius first had the idea of measuring the length and breadth of skull or head and using the length-breadth index (or skull-index), i. e., the breadth calculated as percentage of the length, as a criterion to

distinguish different groups of mankind from each other. According to the classification of the index values, later generally accepted, dolichocephalics are people or races with skull indices up to 75.0, brachycephalics are those with indices higher than 80.0, while those between 75.0 and 80.0 are mesocephalics. If the classification is applied to heads the values of the separate classes are to be advanced one point, that is to say, dolichocephalics go up to 76.0 and the brachycephalics begin with 81.0. The greatest length is defined as the greatest anterior-posterior diameter of the brain case in a median

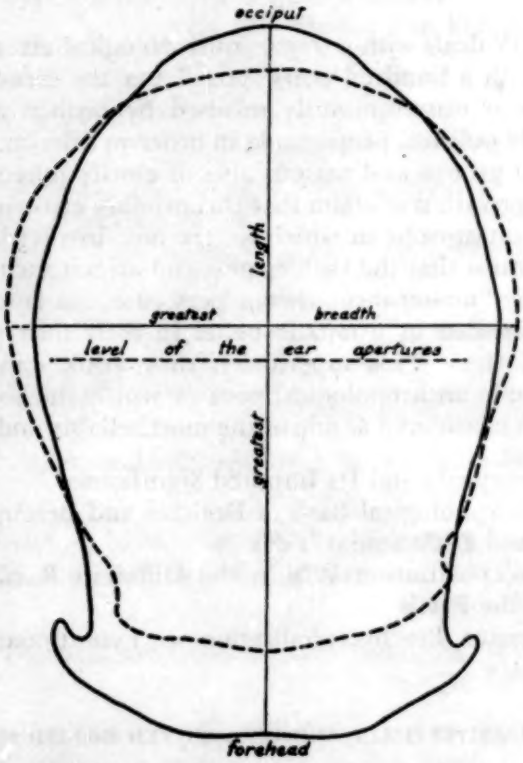

FIG. 1. Contours of two skulls viewed from above. Solid line: male Australian aborigine with a hyperdolichocephalic index of 66.8. Broken line: female Indonesian Malay with a hyperbrachycephalic index of 89.9. The skulls superimposed on the mid-line and a transverse line connecting the ear apertures. The Malay skull is asymmetric. (×½ approx.)

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line taken from the most prominent point above the saddle of the nose (glabella) to the most prominent point at the posterior end of this line regardless of the level above the base of the skull (opisthocranion). The greatest breadth is the greatest transverse diameter of the brain case at a right angle to the median plane wherever it may be found above the level at the ear region. Figure 1 shows the contours of two skulls viewed from above: one (solid line) is the skull of a male Australian native, the other (broken line) is the skull of a female Indonesian Malay. The craniograms are superimposed on the transverse line (fine dash line) which connects the landmarks indicating the position of the ear apertures. The greatest length and the greatest breadth are marked by fine lines. Incidentally, the greatest breadths coincide, both being situated at the same distance from the ear transversal. The greatest length of the Australian skull is 192 mm, its greatest breadth is 128 mm, and the length-breadth index (128 x 100/192) is 66.8. The corresponding figures of the Malayan skull are 157 mm, 141 mm, and (141 x 100/157) 89.9. The Australian is "hyperdolichocephalic," the Malay is "hyperbrachycephalic." The round head when compared with the long head owes its special form to a considerable shortening of its length rather than to an increase of its breadth.

The index varies, of course, from individual to individual but its amplitude can remain within certain limits in a given population. This peculiarity made the index suitable as a racial character. It is obvious, however, that a race cannot be determined by such a property alone. Yet the relative facility with which the length and breadth measurements can be taken resulted in the skull index being widely esteemed as a racial character *par excellence*. Not only laymen showed a particular predilection for the hobby of taking skull measurements, but also professional anthropologists fell into the error of regarding the index as one of the chief criteria in the distinction of races and as a main test for their kinship. Morant (1928), for example, undertook a statistical analysis of 31 cranial characters and found that six had greater diagnostic values than the other twenty-five combined. Among these six the length-breadth index is esteemed by Morant as the most important, nearly twice as reliable as any other.

One of the earliest results of the skull measurements among the

European population was the recognition of the existence of three zones: in two zones, a northern and a southern one, the dolichocephalic population prevails, and in one zone, the middle one, the brachycephalic population prevails. The northern dolichocephalic zone chiefly coincides with those regions which are inhabited by the so-called Nordic Race; the southern dolichocephalic zone with those regions which are inhabited by the so-called Mediterranean Race; and the middle brachycephalic zone coincides with those regions inhabited by the so-called Alpine and Dinaric Races. The examination of European skulls of prehistoric or early times obtained from the three zones revealed the surprising fact that the population of the now brachycephalic middle zone was anciently dolichocephalic like that of the northern and southern zones, which, on the whole, did not show signs of having changed their skull indices correspondingly. Hug (1939-40) puts this problem as follows:

> . . . the skulls of prehistoric and early historic tribes of Europe are in general more dolichocephalic than their recent descendants. This holds good for all regions of Europe to a smaller or greater extent. Also territories which today show a relatively dolichocephalic population, as parts of Italy, Spain, Scandinavia, Great Britain, and Northwestern Germany, formerly possessed a higher percentage of dolichocephalics. In all Central Europe a marked brachycephalic type has developed in historic times, and this expands in a wide circle around the Alps as a center.*

This phenomenon has been explained by the almost generally accepted theory of substitution, according to which the originally dolichocephalic "autochthonous" population has been replaced in the course of time by brachycephalic alien elements which originated in Central Asia and migrated in a western direction. Historical facts which prove repeated invasions of Europe by Central Asiatic hordes from early Roman times until the 18th Century can be brought forward in favor of this theory. But a prerequisite of any such assumption, namely, evidence that Central Asia was inhabited during all these times by brachycephalic populations which served as sources, has never been presented. This is all the more strange as, according to Lebzelter (1935) and others, the main change in the character of the Central European skull-form must have taken place around 1000 A. D., for some regions earlier, for some later. The change falls

* Translated from the German.

chiefly in the Middle Ages, for, as Hug (1939-40) stated, skulls of recent time are more brachycephalic than those of the early Middle Ages. Yet the assumption of waves of immigration did not satisfy all the authors; some were thinking of a kind of "surreptitious infiltration" which may have led to the present conditions.

The identification of the dolichocephalics of the Northern European zone with the Nordic Race, that of the brachycephalics of the Middle European zone with the Alpine and Dinaric Races have had curious consequences. All the mental qualities which have been attributed to these races by certain earlier students of the history of culture like Count Gobineau were transferred to the European bearers of dolicho- or brachycephalic skulls. The French sociologist de Lapouge (1888) first endowed the blue-eyed dolichocephalics with all the qualities considered by him as the best and most appreciated and the brachycephalics with the worst and most undesirable ones. But Lapouge was outdone by O. Ammon (1893), a German newspaper man and amateur anthropologist, who portrays the intellectual, moral, and social characters of the two opposite skull types of the Central European population as follows:

> The long heads (dolichocephalics) of German descent represent the bearers of higher spiritual life, the occupants of dominant positions to which they are destined by nature, the innate defenders of the fatherland and the social order. Their whole character predetermines them to aristocracy. They have taste for a bourgeois life only to a small extent, whereas the round heads (brachycephalics) have this quality very pronounced. Dexterous in both agricultural and technical practice, in trade and money transactions, the round heads are excellent farmers, workmen, merchants, and in most cases obedient subjects. . . . From purely scientific interests to which the long heads are driven by their desire for knowledge and to which they devote all the impetus of their character, the round heads keep more aloof. Their inclination to the democratic theory of equality is due to the fact that they themselves do not exceed mediocrity and feel nothing but an aversion if not hatred, against grandness which they cannot understand.*

De Lapouge restricted the good qualities at least to the blue-eyed dolichocephalics; Ammon speaks in the paragraph cited only of the dolichocephalics of German descent, but later on in his book, where he deals with the "evidences" of his assumption, there remains no other criterion for the good qualities but the skull index. So he

* Translated from the German.

claims: "The scholars who have attained important positions are pronouncedly long-headed and their heads show large dimensions."* How Ammon proved this thesis is best reported in his own words:

> To obtain the necessary figures I decided to ask the members of the Society of Natural History in Karlsruhe for their permission to take the measurements of their heads at one of the meetings. The first evening I chose for the execution of this plan was unfavorable in so far as there was a terrible tempest at the time the meeting was to begin. Therefore only twelve members were present. Nevertheless, the natural selection [sic!] caused by this impediment was not without interest. For, as it turned out afterwards, the series of members who went to the meeting despite storm and rain was much more long-headed than those whose measurements were taken at a later meeting.*

Profession	*Dolichocephalics in per cent*	*Brachycephalics in per cent*	*Average index*	*Average length in mm*	*Average breadth in mm*
Scholars (1st category)	41.7	——	79.6	195	155
Scholars (2nd category)	27.8	11.1	81.9	189	155

These are the figures obtained by Ammon, so far as they refer to scholars; unfortunately, but probably intentionally, only the average of the indices is given in Ammon's table and not the percentage of the individual indices. Scholars "of the first category" are the heroic ones who braved the weather; scholars "of the second category" are the cowards who stayed at home.

The irony of Ammon's statistics lies in the fact that the average index of his scholars in the first category is 79.6. This is not in any sense a dolichocephalic index in the strict sense but a mesocephalic, and in addition a relatively high one. However this may be, the poorness of those "'anthropological" studies has been excelled by those of later German authors. The dentist and amateur anthropologist Röse (1905-06) tried to put Ammon's statistics on a broader basis. But, unfortunately, his material (he worked in Saxony) contained very few long heads. He found, for example, that among the staff members of the polytechnical school in Dresden the full professors had an average index of 86.0 while the associate and assistant

*Translated from the German.

professors had one of 84.4, and the assistants one of 85.5. This and other similar adverse experiences led him to the conclusion that not the index but the length of the head is the decisive factor. "The higher the position and the salary [sic!] the longer and larger are the heads."* As a long head is characteristic of the Nordic Race, Röse claims: "The Nordic racial component of the German people is the main bearer of its mental power."* In associating the form of the skull with certain physical properties these people even went so far as to use the index as a gauge for reading the intellectual and moral qualities of certain groups of the population. The lower the index, that is to say the more the skull approaches the dolichocephalic, the more superior are these qualities; the higher the index, that is to say the more brachycephalic the skull, the more inferior these qualities. In the last thirty years, during which political and social tension in Central Europe reached its climax, this sort of "anthropology" has been popularized, particularly by the philologist Hans F. K. Günther and other writers with similar qualifications. Favored by professional anthropologists for political reasons, this kind of anthropology has become a sport in Germany and Austria. One could find youths riding on the railroad with one of Günther's books on their knees and comparing the head forms of their fellow passengers with the racial prototypes depicted in the books.

The mania to attribute diagnostic significance to the skull index spread wider and wider and infested even real scientists who should have been immune to or more sceptical of such temptations. The well-known Dutch neurologist Ariëns Kappers devoted years to studying the skulls and head indices of the populations of the Near East in order to find their relationship to Central and West European peoples. It is of interest that in later years the turn of the tide finally came. The first impetus undoubtedly was given by Franz Boas (1912) and his school who were able to show that the index is not the stable factor as was first taken for granted, but is subject to environmental influences which may alter the index from one generation to the next. However, in Germany, a second tendency spread parallel to the first. The politically inspired awakening of "racial consciousness" led to the need to have a complete anthropological

* Translated from the German.

census of the whole population within the frontiers of Germany itself and the adjacent countries inhabited by German-speaking peoples. This survey was made with great zeal, but with a very disappointing and detrimental effect. It turned out that Germany was not inhabited by blue-eyed long heads as the nationalists expected but by markedly fair or dark-eyed round heads with an average index of 83.8. According to Gerhardt's (1937-38) latest figures, blue-eyed blond dolichocephalics are very rare in Germany and do not constitute more than 0.8-6.7 per cent of the entire population even in the most Nordic areas of north Germany. This was very far from the Germanic ideal of Sweden's population with 31 per cent long heads and other Nordic racial characters (Lundborg and Linders, 1926). Thus the great majority of the population of the German homeland

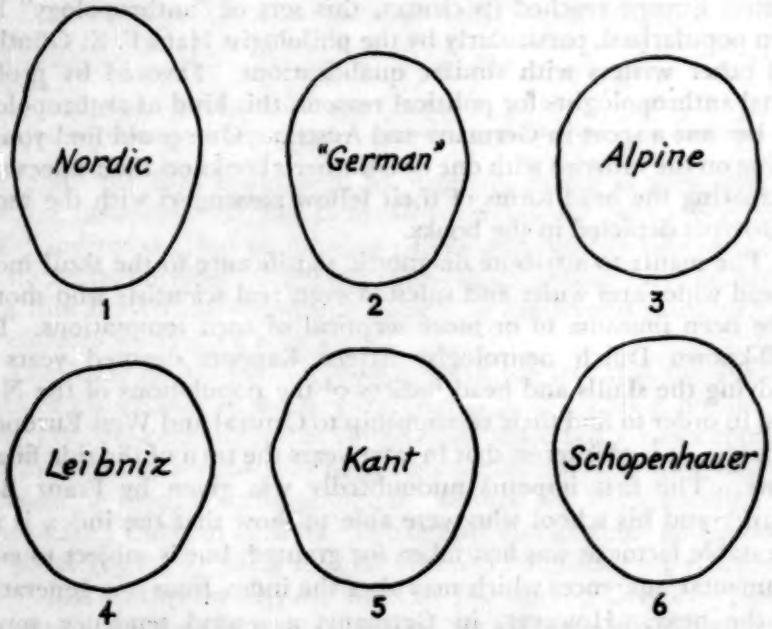

FIG. 2. Contours of skulls viewed from above to show typical skull forms. After Walter Redmann (1927). No. 1, "Nordic-Anglo-Saxon" skull; No. 2, "German" skull; No. 3, "'Ostic" (Alpine) skull; No. 4, Leibniz's skull; No. 5, Kant's skull; No. 6, Schopenhauer's head. No. 4 to 6 after F. Weidenreich (1927).

must have just these moral qualities which were, in the eyes of the Nordic fanatics, the worst a white man could own, just as evil, or even worse, than those of Jews and Negroes. Moreover, a favored means of political propaganda has been the publication of short articles in illustrated magazines which dealt with racial problems in popular form. These were usually signed by otherwise completely unknown authors. The three skull contours (Nos. 1-3) in Figure 2, for example, are taken from such an article (Redmann, 1927). No. 1 is designed as "Nordic-Anglo-Saxon skull (long head)," No. 3 as "Ostic-Alpine skull (round head)," and No. 2 as "German skull (oval form)." The calculated indices of the three skulls are as follows: No. 1, 70.6; No. 2, 77.4; No. 3, 91.6, or in other words, the Nordic long head is dolichocephalic, the Alpine round head is ultrabrachycephalic, and the German oval head (a newly-created anthropological type) is mesocephalic. One can imagine the shock an intelligent German reader suffered when he remembered that many of the great German heroes from Bismarck down to Hindenburg and Hitler were brachycephalics and even hyperbrachycephalics, and that the three greatest philosophers Germany has produced—Leibniz, Kant, and Schopenhauer—had round heads in the most extreme form (Fig. 2, No. 4, Leibniz, skull index 90.3[!]; No. 5, Kant, skull index 88.5; No. 6, Schopenhauer, head index 90.0 [!]). Something had to be done about this rift between bare anthropological facts and the demands of the racial theory as preached and popularized by people like Ammon, Röse, Günther, Fischer, Lenz, and others.

Two ways were open. One could forget what had been said before about racial differences based on the head form or one could differentiate between good and bad round heads. Otto Aichel, a practical obstetrician, and later professor of physical anthropology, took both ways. He found out (1933) that the round heads were not late immigrants from Central Asia who spoiled the "pure" Nordic German blood, as had been asserted earlier. Had Aichel studied the literature, particularly Scheidt's book (1924), on the races of the Neolithic of Europe, he would have been aware of this fact. Two skulls which were excavated from early tombs in North Germany were evidence, according to Aichel, that round heads had migrated to Germany in the Paleolithic. Therefore, they settled on German soil at the same time as the Nordic people which, inci-

dentally, also came from the East. Aichel does not say that these are the good round heads, but his book, *Der deutsche Mensch,* ends with an apotheosis of Hitler and Hitler's book *Mein Kampf,* scarcely justified in this place, unless it implies the assurance that for anthropological reasons round-headed Germans can be good Nazis, too, and do not lag behind the Nordic long-headed Germans in this respect. In spite of its appreciable aims Aichel's book was disregarded in silence by the more professional German anthropologists. Eugen Fischer, one of the authors of *Human Heredity* (1931) and like Aichel a pronounced brachycephalic himself, was slyer than his co-author F. Lenz who kept strictly in line with de Lapouge, Ammon, and Röse. Fischer believed that external conditions may change the character of the head form in a given population and that, therefore, the skull index cannot be used as a reliable racial character. His pupil Gerhardt (1937-38) went farther; after having scrutinized the head indices of all the races and populations over the whole world, he arrived at the conclusion that the mere statement of brachycephalic conditions has no meaning at all and does not imply a close relationship between one brachycephalic race and another. In this way the old dangerous deduction that the anthropological structure of the German people has changed in the direction of immigrated or infiltrated, undesirable Asiatic elements was averted. Gerhardt claims: Brachycephaly can and will originate from quite different bases and by quite different mutations; mutations can affect different cranial bones or cranial regions. The qualification of skulls as brachycephalic, therefore, does not state anything about the real character or the special type to which they belong. This statement and its implication is very clear.

II THE MORPHOLOGICAL BASIS OF DOLICHO- AND BRACHYCEPHALY

The skull index is nothing but a numeric expression for the relation between the greatest length and the greatest breadth of the brain case. If the brain case is long but narrow, the skull is dolichocephalic. However, a skull with the same length becomes brachycephalic when its breadth exceeds a certain mark. By definition a skull with a length of 185 mm is dolichocephalic if its breadth is not greater than 138.56 mm; if the breadth is 138.75 mm the skull becomes mesocephalic, and if the breadth goes up to 148.0 mm it is

brachycephalic. In other words, a difference of 0.2 mm in breadth changes a dolichocephalic skull into a mesocephalic one, and the same difference of 0.2 mm changes a skull from a mesocephalic into a brachycephalic one. If the skull has a length of 195 mm it will be considered dolichocephalic even if the breadth is 146.05 mm, while the skull with a length of 175 mm will be brachycephalic if it is 6 mm narrower than the aforementioned.

The skull index, therefore, depends upon two factors: the variation of the length and the variation of the breadth. As I have shown in my papers, *On the Role of the Brain and the Transformation of the Human Skull* (1941), and *The Sinanthropus Skull: a Comparative Study of a Hominid Skull* (1943), we have to go back to the earliest known phases of human evolution to understand the trans-

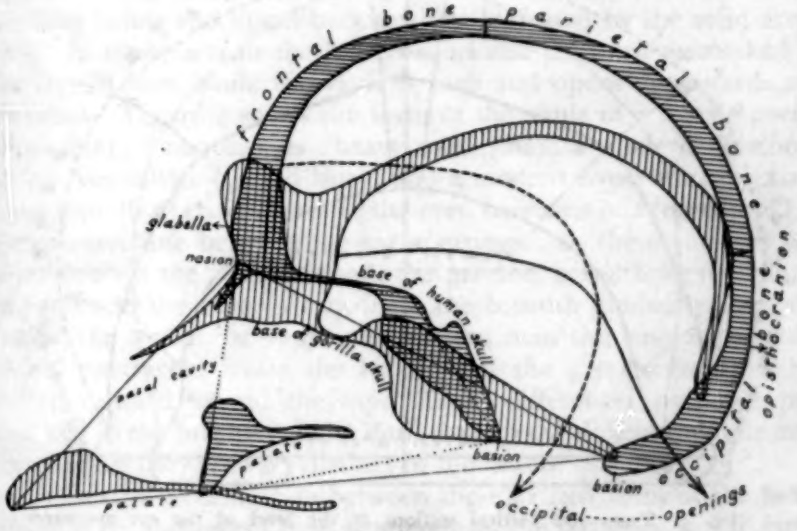

FIG. 3. Longitudinal section through the midline of a male gorilla skull (vertically shaded) and a male hyperbrachycephalic European skull (horizontally shaded). Both skulls superimposed on the nasion parallel to the eye horizontals. The direction of the axis of the cranial cavity is indicated by an arrow (solid line: gorilla; broken line: man). The gorilla skull has a long straight base (axis indicated by a fine line) and a flat cavity. The human skull has a deflected base (axis indicated by a bent dotted line) and a high rounded cavity. (×2/5 approx.)

formation the brain case underwent in the course of time. Figuratively the form of the brain case of Pithecanthropus and Sinanthropus may be likened to that of a short loaf of bread: the base is a plane and the body represents an ovoid. The greatest breadth measured above the ear aperture is about 73 per cent of the length. The length and the breadth are greatest at the base and both decrease upwards. The schematic form of the brain case of modern man, however, can be compared with a globe. Its base is deflected, the occipital portion having been bent downwards. The body has become inflated, the greatest lengths as well as breadths having shifted from the base upwards, the breadth shifting more than the length. The base appears smaller in both length and breadth, not only in proportion to these

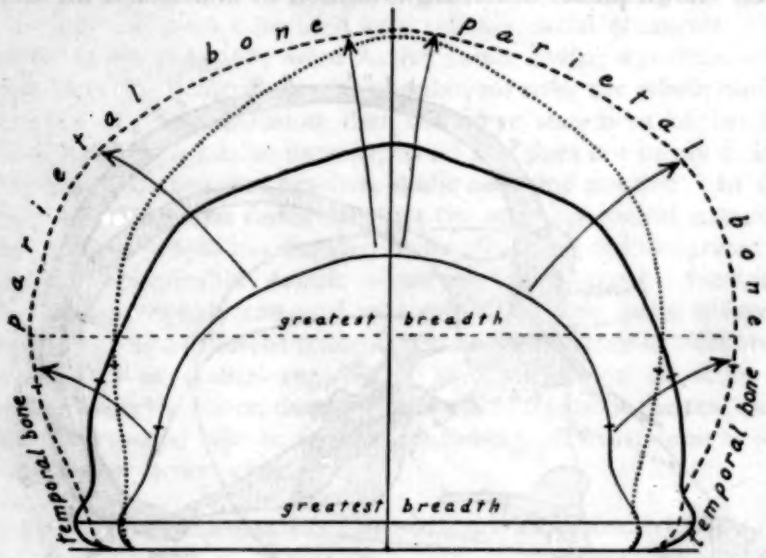

FIG. 4. Transverse vertical sections at the level of the ear apertures through the skulls of a female gorilla (fine line), Sinanthropus Pekinensis (heavy line), hyperdolichocephalic Australian native (skull index 66.4) (dotted line), and a hyperbrachycephalic European (skull index 89.2) (broken line). The points marked on the left and right sides of the four contours indicate the suture joints between the temporal and the parietal bones. The arrows indicate the direction in which the individual bones of the brain case move as a consequence of the expansion of the brain. Note the outward turning of the squamous portions of the temporal bones. (×2/3 approx.)

dimensions, but also absolutely, when compared with the Pithecanthropus-Sinanthropus phase. The average length of the base is 145 mm in Sinanthropus and 135 mm in modern man, and the average breadth of the base is 141 mm in the first case, while it is 134 mm in the latter. Figures 3 and 4 demonstrate the principle of this change in the construction of the human skull. Figure 3 shows this on a longitudinal section along the midline from front to back and Figure 4 shows the same on a transverse vertical section along the level of the ear apertures. In Figure 3 the skull of a male gorilla and that of a modern hyperbrachycephalic European are superimposed on the nasion parallel to the eye horizontal. In the earliest human forms the base of the skull is fragmentary. I therefore substituted for it a gorilla skull because the principle is the same. The base of the primitive skull indicated by a fine straight line between nasion and basion is long and neither curved nor deflected. The vault above the base is low and opens backwards as indicated by the solid arrow line. In modern man the base is short and deflected as marked by the dotted line, while the vault is high and opens downwards and forwards. Figure 4 shows the form of the vault of a female gorilla (fine line), Sinanthropus (heavy solid line), a modern dolichocephalic Australian (dotted line), and a modern hyperbrachycephalic European (broken line) above the even base which is represented by a transverse line between the ear apertures. In the great apes and Sinanthropus the base is broad, the greatest breadth being located very close to the base. From there the breadth gradually decreases toward the top of the vault. In modern man the base appears distinctly contracted while the location of the greatest breadth has shifted upward toward the top. These differences are more pronounced in the brachycephalic skull than in the dolichocephalic one; nevertheless they are very distinct in the latter.

The essential difference between the idealized form of the brain case of early and recent man is, therefore, the tendency in the latter to approach a globular form by contracting its base and expanding in height as well as in breadth above the base (cf. Figs. 3 and 4). The process which brought about this transformation can best be described as an "opening" of the brain case. The brain case is a compound of seven individual bones. If the smallest, the ethmoidal, is omitted, of the six remaining bones, four, namely the

frontal, occipital, and the two temporals, constitute the basal portion, which takes part in the formation of the wall or the roof of the brain case. Only the two parietal bones have the character of squamæ. The opening or the expansion of the brain case—except for the deflection at the base (Fig. 3)—involves only the squamous portions of the individual bones (Fig. 4). In those which are compounded of a basal and a squamous portion, the latter turns around an axis which runs parallel to the junction of the portions. The frontal squama (forehead) moves from a prone position to an erect one and the two temporal squamæ which are primarily inclined inwards move outwards. The occipital squama as a whole does not show a special alteration of its position with regard to the basal portion, for the entire bone has been shifted downward (Fig. 3). Nevertheless, the effect of the "opening" is manifested in a considerable widening of the angle which the inferior part of the squama forms with the superior one. The parietal bones have to fill the gradually increasing gap between the four remaining bones connected with the base. So the area covered by them becomes larger and larger and they have to grow in all directions to meet this need. In addition to the deflection of the base and the assumption of a more globular form, which causes a shortening of the primary greatest length of the skull (Fig. 3), the length undergoes a reduction of quite a different kind. The primitive brain case carries a special system of reinforcing bony structures, best developed in front and rear, of the region of the landmarks (glabella and opisthocranion) where the length measurement is taken. These heavy prominences (glabella and occipital tori) have disappeared in recent man, the rear prominence completely, the front one almost completely, while the breadth was not affected by any similar process.

These two changes which take place in the human brain case are phenomena characteristic of the phylogenetic evolution of man and, therefore, quite independent of any special racial differentiations. But as I have shown, they are of a very complex nature, and the single factors involved show many and manifold morphological features so that they cannot be expected to be found developed or reduced all at the same time in each individual or in each group, racial or otherwise. In any case, what we call the skull index does not give any, or at best only very vague information of the trans-

formation the human skull has undergone. A skull of modern man with an index of 72.7 is morphologically and structurally quite another thing from a Pithecanthropus or Sinanthropus skull with the same index. Brachycephalic skulls with indices over 80 have not been found in early primitive man, so that indices from 85 to 100 certainly indicate a new skull type regardless of the special race in which they may occur. Gerhardt (1937-38) is quite right in claiming: "Brachycephaly can and must have quite a different meaning from case to case. It may be taken for granted that the shaping of typically brachycephalic skull forms has often occurred independently." But Gerhardt is not right in continuing:

> The morphologically different structures of the individual types have occasionally brought about brachycephaly as, so to say, a purely accidental by-product.

or when he claims:

> Brachycephaly in its real character is only the expression of a mutative process which took place in a skull, organically formed according to the inherited qualities of its components. This process must differ morphologically from race to race. Brachycephaly originates from quite different bases and by quite different mutations; mutations can occur in quite different cranial bones or regions.*

If we neglect the mutation problem, Gerhardt believes that each race produces its own brachycephaly by as many mutations as there are brachycephalic races. He arrived at these conclusions not by comparative anatomical studies of different brachycephalic types—for there is nothing in his paper, despite its enormous length, which justifies such an assumption—but only by deduction from statistical material on average indices of all the peoples of the Old World. Gerhardt did not recognize that brachycephalization is a general phenomenon affecting recent mankind as a whole and that its intrinsic cause is the same everywhere, namely, the tendency of the braincase to adopt more and more a globular form.

III ECTO- AND ENDOCRANIAL INDEX

The authors who connected the skull index, with all the differences in its degrees, with mental qualities were led by the concept that the special form of the braincase has some special relation to its

*Translated from the German.

TABLE 1

	Ectocranial length	*Ectocranial breadth*	*Endocranial length*	*Endocranial breadth*	*Difference in length*	*Difference in breadth*	*Ectocranial index*	*Endocranial index*	*Differences in the indices*
Archanthropinæ									
Sinanthropus III	188	137	156	122	32	15	72.8	78.3	+5.5
Sinanthropus X	199	143	173	128	26	15	71,8	74.2	+2.4
Sinanthropus XI	192	140	167	128	25	12	72.9	76.7	+3.8
Sinanthropus XII	195	141	168	129	27	12	72.3	76.8	+4.5
Pithecanthropus II	176	135	148	121	28	14	76.7	81.8	+5.1
Homo Soloensis V	219	145	175	133	44	12	66.3	76.2	+9.9
Paleoanthropinæ									
Rhodesia	199	144	173	136	26	12	72.3	78.8	+6.5
Neanderthalians	199	147	175	137	24	10	73.8	78.6	+4.5
La Chapelle	208	156	186	147	22	9	75.0	79.0	+4.0
Gibraltar	193	149	168	141	25	8	77.2	83.9	+6.7
Ehringdorf	196	145	171	135	25	10	74.0	78.8	+4.8
Tabūn I	183	141	161	130	22	11	77.1	80.8	+3.7
Skhūl V	192	143	167	134	25	9	74.5	80.3	+5.8
Neoanthropinæ									
Australian	187	131	171	125	16	6	70.0	73.1	+3.1
Chinese	186	131	175	130	11	1	70.5	74.3	+3.8
European	172	131	154	123	18	8	76.3	79.8	+3.5
European	194	150	182	139	12	11	77.4	76.3	-1.1
European	186	148	158	137	18	11	79.6	86.7	+7.1
European	176	144	159	130	17	14	81.8	81.8	±0
European	163	140	151	133	12	7	85.9	88.1	-2.3
European	168	159	160	152	8	7	94.6	95.0	+0.4

content, the brain. They never said so directly; yet unless this was the idea, it is hard to understand why they insisted on attributing superior mental qualities only to dolichocephalics and the poor ones only to brachycephalics. Since, however, the occasional lodging of the brain of a genius in a brachycephalic skull could not be denied, the German racial psychologists like Lenz (1931) claim that dark-haired brachycephalic Germans can have the same Nordic qualities of mind as fair-haired dolichocephalics have. Clauss (1926) in his

TABLE 2

	Archanthropinæ		*Paleoanthropinæ*		*Neoanthropinæ (Modern Man)*	
	Min.-Max. Values	*Average*	*Min.-Max. Values*	*Average*	*Min.-Max. Values*	*Average*
Differences between ectocranial and endocranial greatest length	25-44	30.3	22-26	24.1	2-18	12.8
Differences between ectocranial and endocranial greatest breadth	12.0-15.0	13.3	8-12	9.8	1-14	7.2
Ectocranial indices	66.3-76.7	72.1	72.3-77.2	74.8	70.0-94.6	82.3
Endocranial indices	74.2-81.8	77.3	78.3-83.9	80.0	73.4-95.0	84.3
Differences between ectocranial and endocranial index	2.4- 9.9	+5.2	3.7- 6.7	+5.1	-3.6-+7.1	+1.8

book *Rasse und Seele* says, for example, that "a glance at each of Beethoven's portraits proves that he succeeded in wresting a Nordic expression from his Alpine body."*

There cannnot be conformity between the ectocranial and the endocranial form of the brain case. In other words, quite apart from the size of the brain, to which there will be reference later, the endocranial index must differ from the ectocranial one. In Table 1 the ecto- and endocranial lengths and breadths, their differences in millimeters, and the ectocranial and endocranial indices and their differences in units, are listed for Archanthropinæ (Pithecanthropus, Sinanthropus, Homo soloensis) and Paleoanthropinæ (Neanderthalians) where such figures are available. Some figures referring to modern man have been added. In the latter case the material is very small because nobody has so far taken the pains to calculate the form and size of the brain on the same basis as that of the brain

*Translated from the German.

case. The specimens listed in Table 1 are picked from twenty measured skulls; they represent dolichocephalic, mesocephalic, brachy- and hyperbrachycephalic skulls.

In Table 2, the minimum-maximum values and the averages of these measurements and indices of the same human groups have been listed. Some of the measurements of modern man I have made are listed in Table 1; they range from an index of 70 to an index of over 90. In some cases the measurements have been taken from endocasts, in other cases directly from the skull. Table 1 shows that in all groups the endocranial index generally exceeds the ectocranial index, so that in dolichocephalics the brain form tends to mesocephaly while in mesocephalics to brachycephaly. In modern man cases occur where both indices are the same or where the endocranial index is smaller than the ectocranial. This may happen in each index category but especially in brachycephalic skulls. The difference between the ectocranial and endocranial lengths has been reduced in modern man to more than half of the original difference (58 per cent), while that between the breadth to less than a half (46 per cent). The reduction in length is, therefore, about 12 per cent greater than the reduction in breadth or, in other words, *the transformation of the skull favors a shortening of the length but an increment of the width.*

The phenomenon that the endocranial index is higher than the ectocranial is not confined to man. Harris (1926) calculated the value of the endocranial index of 35 male and 12 female gorilla skulls on the basis of skiagrams, while the ectocranial length and breadth were measured in the usual way. The average ectocranial index of the males was 71.8, the endocranial 78.0; the corresponding figures of the females were 77.7 and 82.7. In both cases the endocranial indices were mesocephalic or brachycephalic, the ectocranial ones mesocephalic or dolichocephalic. Female gorillas have the brains more rounded than males.

The discrepancies between the two indices in man are due to differences in the thickness of the walls of the brain case and above all to the fact that the greatest length and the greatest breadth of ecto- and endocrania never can coincide. Only if all this is realized will one understand the unfathomable stupidity of a sentence like this: "even for a scholar it is an irresistible observation that the fate

of a man more or less depends upon two or three millimeters in length or breadth of his skull."* The French sociologist de Lapouge said this (1899), and Ammon, Röse, and Hans F. K. Günther down to the smallest Nazi propagandists of all countries have followed this line.

Anyone who is familiar with the problem of the correlation of the size and form of brain with mental capacity knows that all investigations seeking clear evidence of those relations were frustrated. The mental qualities are apparently bound to the cortex of the cerebrum, and their increase chiefly depends on the expansion of the brain surface. The area of this surface can be augmented by the process of fissuration, and the mass of the cortex by an increase of its thickness, but both occurrences are quite independent of the size of the brain and, of course, more so of the relation between its length and breadth. As to the brain size, R. Pearl (1905-6) tried to discover whether there is a difference in the brain weight between dolichocephalic and brachycephalic skulls. He arrived at the following conclusion: "On the whole, there seems to be little or no evidence that either dolichocephaly or brachycephaly is associated with large brain weight." In females "the brachycephalic array gives a brain weight about 40 g higher than the dolichocephalic" (for English and "Altbayerisch" series). According to Schwerz (1912) the average capacity of dolichocephalic skulls of early historic times and that of recent brachycephalic skulls of Switzerland show no significant differences, the first group having a capacity of 1474 cc for males and 1307 cc for females, the latter one of 1483 cc for males and 1340 cc for females. Hug (1939-40) drew frequency curves of the cranial capacity of Alamanni skulls (5th to 8th Centuries) from Switzerland and south Germany with an average index of 75.6 and of modern skulls (19th Century) from the same territories with an average index of 83.8. Figure 5, a copy of Hug's curves, shows that there is practically no difference in capacity between the dolichocephalic and brachycephalic series. Parsons (1922) states with regard to the increasing brachycephaly of the British Isles in historic times: "Our records do not give us any reason for thinking that the size of the modern Englishman's head is increasing with the increas-

*Translated from the French.

ing rotundity."[1] The increasing brachycephalization of the recent European population was accompanied neither by an increase nor by a decrease of the cranial capacity; therefore, the size of the brain remained stable in spite of the change of the form of the brain case.

If dolichocephaly and brachycephaly have special meanings and can serve as clues for the recognition of mental qualities, this would not be confined to European racial groups but would become evident all over the world wherever dolichocephalic and brachycephalic races are found. But not even the most radical partisan of this theory ever made the attempt to apply it to non-European races. For it seemed obvious even to the most naive observer that the Australian native with an average head index of *circa* 72 is not superior mentally to an ultrabrachycephalic Bavarian with an index of *circa* 89.

All this shows that to claim mental superiority or inferiority for certain groups of modern mankind basing the claim on the form of the braincase cannot be supported by any data furnished by scientific methods. The attempt to equip dolichocephalics as such with certain characteristic mental qualities and brachycephalics as such with certain others, opposed to the first, is nothing but a revival of Gall's phrenology which flourished at the turn of the 18th Century,

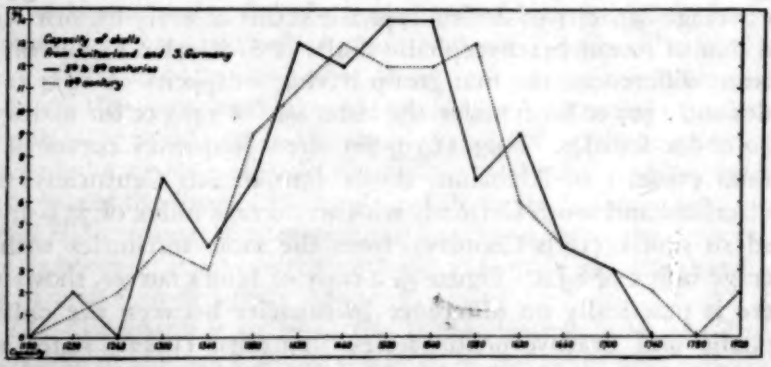

FIG. 5. Frequency curves of the cranial capacity of Alamanni skulls from Switzerland and south Germany (5th to 8th Centuries) with an average dolichocephalic index of 75.6 (solid line) and of modern skulls from the same territories (19th Century) with an average brachycephalic index of 83.8 (broken line), after Hug (1939-40, Fig. 5).

and is even more arbitrary and senseless than Gall's theory. Gall tried, at least, to determine the mental qualities of a given individual according to the development of special bulges on the outside of his braincase. He supposed that an excess of a mental quality caused the swelling of a particular area of the brain surface, and that this swelling in its turn brought about a prominence visible or palpable on the outside of the skull and head. The modern racial phrenology is an obvious retrogression even compared with Gall's ideas. For it does not deal with individuals but with whole human groups, nor does it take into account special differentiations of the brain surface. It rests only on the more or less fortuitous relation between length and breadth of the bony case which lodges the brain.

IV. BRACHYCEPHALIZATION WITHIN THE DIFFERENT RACIAL GROUPS OF THE EARTH

The skulls of the earliest human group (Archanthropinæ) are dolichocephalic; the average index of Sinanthropus is 72.2, that of Homo soloensis 72.0, but Soloensis Skull IX has an index of 76.7 and Pithecanthropus II has one of 76.5. These two skulls are already, therefore, in the mesocephalic group. Among the Neanderthalians (Paleoanthropinæ) the conditions are the same. The average index is 73.3, but mesocephalic skulls occur in Neanderthalians also as the Gibraltar skull with an index of 76.3 reveals. In the fossil forms of modern man (Neoanthropinæ) brachycephalics make their appearance.

Twenty-seven Palaeolithic European skulls measured by Morant (1930-31) have an average index of 71.8, but among them is a group of five skulls, the Solutré skulls, the indices of which range from 76.0 to 85.2, with an average of 80.2. The 22 remaining skulls range from 66.3 to 75.9, and include, therefore, few mesocephalics and no brachycephalics. Palaeolithic skulls from outside Europe are very rare; the indices of the three skulls from the Upper Cave in Choukoutien (China) range from 69.3 to 71.3 and so have an average index of 70.3 (Weidenreich, 1939). The Wadjak skull of Java has an index of 72.5. Among the Palaeolithic skulls of Afalou (North Africa) which have an average index of 75.2, both mesocephalic and brachycephalic skulls occur, the latter reaching up to 84.0 (Vallois, 1934).

In Mesolithic Europe there seems to be no great change in the character of the skull form. But the Ofnet and Kaufertsberg skulls of Bavaria show a remarkable increase of mesocephalics and brachycephalics. According to Scheidt (1923), of the 11 skulls available for measurements, only 27.2 per cent are dolichocephalic, but 45.5 per cent mesocephalic and 27.2 per cent brachycephalic. Among the latter is a skull with an index of 86.7.

From the beginning of the Neolithic, the percentage of brachycephalics increases in Europe (Krogman, 1937; Hug, 1939-40). But it is incorrect to claim, as has been done in many papers and books, that the Neolithic peoples of Europe were dolichocephalic and the appearance of brachycephalics was due only to a later "invasion" of alien elements. Such statements ignore the fact that there was *always* a great percentage of mesocephalics and a smaller percentage of brachycephalics. To place in such a case the mesocephalics

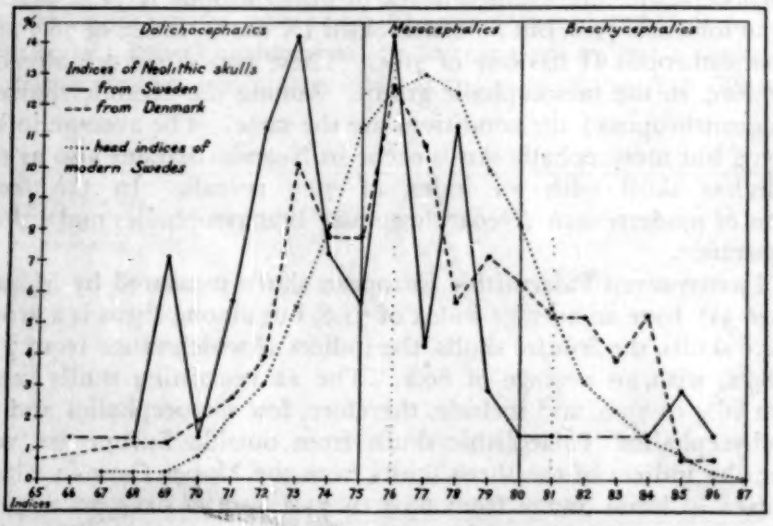

FIG. 6. Frequency curves of the skull indices of the Neolithic population of Sweden, on the basis of data given by Fürst (1912) (solid line), of the Neolithic population of Denmark according to the same source (broken line), and of the modern male population of Sweden according to Lundborg's and Linders' curves (1926, Diagram 16) (dotted line). The data for the modern Swedish population refers to heads.

among the dolichocephalics, that is to say, range a skull with an index of 79.9 among the dolichocephalic group whose upper limit is fixed at 75.0, and separate it thereby from the brachycephalic group whose lower limit begins with 80.0, is a bad statistical trick regarding the significance attributed to these differences in the skull form. The Neolithic population of Sweden represented by 70 skulls (G. Retzius, 1900; Fürst, 1912) consisted of 51.0 per cent dolichocephalics, 40.0 per cent mesocephalics, and 9.0 per cent brachycephalics as the frequency curve in Figure 6 shows. G. Retzius believed that dolichocephalics and brachycephalics represent two entirely different races and the mesocephalics their hybrids. But his proof for this theory is unacceptable. All the special features he regarded as indicative of these racial differences are those which concern the form of the brain case itself and, consequently, cannot be used as evidence of a racial differentiation based on this form. To be sure, the facial bones of the brachycephalic skulls were partly broken away so that they could not lend support to Retzius' theory. The contemporaneous Neolithic population of Great Britain, as represented by the skeletons of the Long Barrows consisted, according to Schuster (1905-06) of 53.5 per cent dolichocephalics, 21.5 per cent mesocephalics, and 25.0 per cent brachycephalics. Of 158 Danish Neolithic skulls of the same period only 30.0 per cent were dolichocephalics, 44.0 per cent mesocephalics, and 26.0 per cent brachycephalics (Fürst, 1912; cf. Fig. 6). In north and central Germany 75 per cent were dolichocephalics, 19 per cent mesocephalics, and 6 per cent brachycephalics (Scheidt, 1924); while the figures for south Germany were in the same sequence, 43.7, 25.1, and 31.2 per cent. This comes close to the figures for Switzerland and Italy, which read as follows: 37.8, 35.6, and 26.6 per cent and 36.7, 33.3, and 30.0 per cent, respectively (Scheidt, 1924). According to Scheidt's tabulation of 490 Neolithic skulls from North and Central Europe, Italy, and Rumania 50.6 per cent are dolichocephalic, 33.5 per cent mesocephalic, and 15.9 per cent brachycephalic. The latter vary from 80.0 to 92.0 with an average index of 82.2. The distribution of the dolichocephalic and brachycephalic Neolithic skulls over Europe is indicated in Figure 7 which is a copy of Scheidt's map. The crosses mark the dolichocephalics, the points brachycephalics.

The Bronze Age brought an increase of the brachycephalics. In

Sweden they increased from 9.0 to 15.0 per cent, while the mesocephalics decreased from 40.0 per cent to 20.0. The dolichocephalic quota has increased from 51.0 to 65.0 per cent (Retzius, 1900; Fürst, 1912). In Great Britain, if the skeletons of the Round Barrows are identified with Bronze Age people, the brachycephalic quota rose from 25.0 per cent to 39.7 per cent; the mesocephalic quota remained almost unchanged (23.0 per cent) and the dolichocephalic quota decreased from 53.5 to 36.5 per cent. The increase of brachycephaly in England has been connected with the appearance of the Beaker Folk (Parsons, 1922). They differed from the "autochthonous" Neolithic population in England as well as in continental Europe not only in their culture, but also physically, in having very broad and high skulls. But it is, to say the least, a great

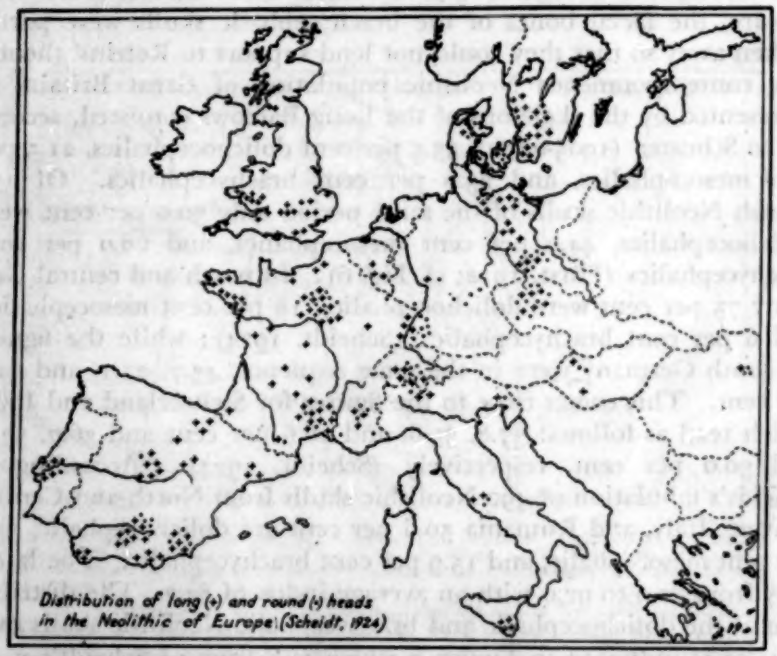

FIG. 7. Distribution of dolichocephalic and brachycephalic skulls in the Neolithic of Europe. Copied from Scheidt (1924). The crosses indicate dolichocephalic skulls and the dots brachycephalic ones.

exaggeration to claim that the appearance of brachycephalics in these countries coincided with the arrival of the Beaker Folk. The claims that North Europe was inhabited during Neolithic times only by a "pure" dolichocephalic type and that "alien" brachycephalic elements appeared there not earlier than the Bronze Age are contrary to the bare figures given above.

The Swedish population of today, according to Lundborg and Linders' measurements (1926) made on 47,000 soldiers and conscripts, shows a remarkable decrease of dolichocephalics (30.2 compared with 65.0 per cent in the Bronze Age) and a corresponding increase of the mesocephalics (from 20.0 to 55.7 per cent) while the quota of the brachycephalics remains almost unchanged (14.1 and 15.0 respectively) (cf. Fig. 6). Were Retzius' aforementioned theory correct, half of the Swedish people of today are hybrids. Whether the dolichocephalics or the brachycephalics can be regarded as "pure" breeds, as assumed by Retzius, is of less importance in view of the fact that in historic times the Swedish population has changed from dolichocephaly to mesocephaly (Fig. 6). To decide whether such a change is due to a decrease in the length of the skull or an increase of breadth, the following figures serve as an indication: The Swedish Neolithic and Bronze Age skulls (males and females) have an average length of 186.1 mm and an average breadth of 138.4 mm (Retzius, 1900). The present Swedish population (represented only by males) have an average head length of 193.8 mm and an average head breadth of 150.4 m (Lundborg and Linders, 1926). Or, reduced to the measurements of the skulls, the figures for the present day population are 188.6 mm for the length and 143.4 mm for the breadth. This indicates distinct increase in breadth.

Even more convincing than these figures are those presented by Hug (1939-40) for Switzerland and south Germany. All refer to skulls, males and females, from Central Europe. This region has been pointed to as offering the most conclusive example that in historic times a population originally dolichocephalic became brachycephalic by infiltration of aliens. Table 3 shows the average index, and its brachycephalic and hyperbrachycephalic quota in percentages from the Iron period up to modern times (16th-18th Centuries). Tables 4 and 5 show how in the same periods the length of the skulls has decreased while the breadth has increased.

TABLE 3

The change of skull index in Switzerland and south Germany from the Iron Age to modern times (after Hug, 1939-40)

Period	*Number of skulls*	*Average index*	*Brachy-cephalics in percentages*	*Hyper-brachy-cephalics in percentages*
Neolithic	81	76.1	22.2	2.5*
Iron Age	37	82.7	81.9	16.2
Roman Period	49	82.7	85.7	14.3
Early Medieval	101	83.1	77.2	22.8
Late Medieval	147	84.2	68.0	32.0
16th-17th Centuries	442	84.4	59.7	40.3

*Calculated from Scheidt's figures (1924).

TABLE 4

The shortening of the brain case of male skulls from Switzerland and south Germany from the Iron Age to modern times, indicated in percentages* (after Hug, 1939-40)

Periods	*Short skulls with length below 169 mm*	*Medium-long skulls with a length from 180-199 mm*	*Long skulls with a length over 200 mm*
Iron Age	11.5	48.1	40.4
Roman Period	18.1	51.1	30.8
Early Medieval	10.1	40.3	49.7
Late Medieval	28.0	38.0	34.0
16th-18th Centuries	61.8	34.3	3.9

*Hug ignored skulls with lengths 170-179 mm and 190-199 mm and with breadths 130-139 mm and 150-159 mm, hence these percentages give only the proportions of skulls within the indicated limits.

TABLE 5

The widening of the brain case of male skulls from Switzerland and south Germany from the Iron Age to modern times, indicated in percentages* (after Hug, 1939-40)

Period	*Narrow skulls with a breadth below 129 mm*	*Medium-broad skulls with a breadth from 140-149 mm*	*Broad skulls with a breadth greater than 160 mm*
Iron Age	9.6	63.5	26.9
Roman Period	22.3	57.5	20.2
Early Medieval	39.8	48.5	11.7
Late Medieval	28.0	50.0	22.0
16th-18th Centuries	5.3	41.7	53.2

*See footnote to Table 4.

Therefore, the increase of the skull index in Central Europe (Switzerland and South Germany) from an average index of 76.1 in the Neolithic to an index of 84.4 in modern times (see Fig. 8)—with an increase of brachycephalics from 22.2 to 59.7 per cent and of hyperbrachycephalics from 2.5 to 40.3 per cent—is due to a corresponding decrease in the length of the brain case and a corresponding increase of the breadth of the skull. According to Hug the length of the male skull varies from 167 mm to 211 mm in the Iron Age, but in modern times only from 160 mm to 200 mm, while the breadth varies during the same periods from 132 mm to 165 mm and from 130 mm to 174 mm. This change apparently went on all the time, but there were two periods in which its pace was accelerated. One coincides with the passage from the Neolithic to the Bronze Age and the second with that of the Roman period to the early Medieval.

If the change is a consequence of the influx of a brachycephalic Central Asiatic population, one would expect that the people who lived east of Central Europe would show the phenomenon the more

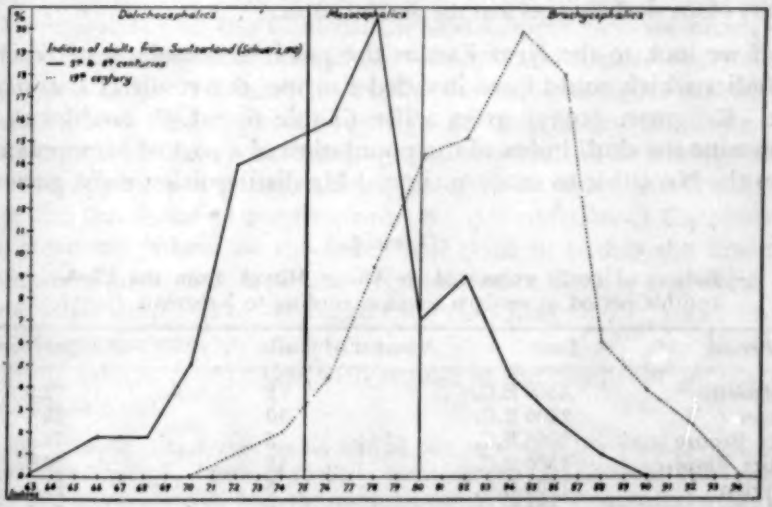

FIG. 8. Frequency curves of the skull indices of early Medieval skulls (5th to 8th Centuries) from Switzerland (solid line) and modern skulls (19th Century) from north Switzerland (dotted line); after Schwerz (1912, Fig. 44).

pronouncedly the closer they live to Central Asia. Yet this is not the case. Out of 63 Neolithic skulls from Silesia, Bohemia, and Moravia 76.2 per cent are dolichocephalic, 17.4 per cent mesocephalic and 6.4 per cent brachycephalic (Scheidt, 1924). This is the same percentage of dolichocephalics as reported from Switzerland and south Germany (see Table 3), and there is only a slight shifting from the mesocephalics to the brachycephalics compared with the figures of Central Europe. As to East Europe, Bunak's (1932) statement is of great importance. He says:

> The types of the skulls of the settling epoch of the East Slavs (9th-12th Centuries) differ essentially from those of today. Among many hundreds of skulls, the specimens which correspond to the modern type represent only a small percentage; the majority of the Kurgan skulls is pronouncedly dolichocephalic (index: 73-78) in those districts where the modern population is brachycephalic. The type of the modern population of East Europe undoubtedly differs in skull index from the Medieval population (9th-12th Centuries) to the same degree that that of West Europe does. With regard to East Europe the theory of immigration is still more unlikely for: (1) Centers of brachycephaly in ancient times of East Europe, from which brachycephalic elements could originate, are not known. . . . (2) Such a substitution of population contrasts with the unchanged conformity of the modern types and the ancient tribes. . . .*

If we look to the Near East as the possible homeland of brachycephalics which could have invaded Europe, the result is also negative. Krogman (1937) gives a list (Table 6) which enables us to determine the skull index of the population of a part of Mesopotamia from the Neolithic to modern times. He distinguishes eight periods,

TABLE 6

Indices of skulls excavated in Alissar Hüyük from the Chalcolithic period to modern times, according to Krogman (1937)

Period	*Date*	*Number of skulls*	*Average index*
Chalcolithic	3500 B.C.	2	72.9
Copper	2500 B.C.	10	75.4
Early Bronze	2000 B.C.	3	78.6
Hittite Empire	1500 B.C.	12	79.8
Phrygian	1000 B.C.	5	72.4
Hellenic	500 B.C.	3	74.6
Roman	0	9	77.0
Turkish	500 A.D.	8	88.4

*Translated from the German.

but for all these periods not more than thirty-eight skulls altogether are available. The seven skulls of Al-Ubaid have an average index of 72.6. Keith (1927) found no trace of any round-headed element in these, but in Kish, according to Buxton (1931), among 26 skulls there were 69.2 per cent dolichocephalics, 23.1 per cent mesocephalics, and 7.7 per cent brachycephalics. Al-Ubaid and Kish correspond in time to the Chalcolithic period. Therefore, in the *Neolithic* period there were *more dolichocephalic and fewer brachycephalic elements in Mesopotamia than in Sweden.*

In spite of the scarcity of the material, it is safe to say that in the Neolithic there was no brachycephalic center in Asia Minor from which an invasion of Europe could have been started on a great scale. Even the few figures available indicate that there was in the Bronze Age, at least in certain regions of Mesopotamia, an increase of mesocephalics coinciding with the increase in Central and West Europe. The average index of the present peoples of Asia Minor who inhabit the same regions is between 84 and 85 (see Gerhardt, 1937-38, and our Table 6).

Farther to the east, a population lived in the Indus Valley (Mohenjo-daro) in the Chalcolithic and Copper periods which was almost completely dolichocephalic (Sewell and Guha, 1931; Guha and Basu, 1938). When two skulls—the measurements of one are doubtful and the other belonged to an infant—are set aside, the average index of the remaining 15 skulls is 67.2. The average skull form of the Indians living in this part of India today is still dolichocephalic, the index amounting to 73.8. An addition of 6.4 units do not mean much because the index still remains within the limits of dolichocephaly. But had the original index been 73.8, these 6.4 more units would have "changed" the dolichocephalic "race" into a brachycephalic one.

R. B. Dixon (1923) says with regard to the Neolithic population of Central Asia:

> Our existing data leaves us no choice but to regard the plateau people as everywhere primarily brachycephalic. Archaeological evidence of this is none, except the scanty material from the northern border of the Transbaikal where supposedly Neolithic sites have yielded brachycephalic and dolichocephalic crania.

Since Dixon wrote this passage very few skulls from prehistoric or early historic times have been recorded in Central Asia. There are

five skulls from the Tarim basin and the borders of the Taklamakan desert, which belong to the earlier centuries of the Christian era, and were brought to England by Sir Aurel Stein and described by Sir Arthur Keith (1929). Their indices vary from 74.5 to 79.9, the average being 76.1. Although not too much weight can be laid on such scanty material, it shows that, at the end of the Middle Ages, Central Asia could not have provided such a compactly brachycephalic population to act as the open or surreptitious invaders of Europe as the substitution theory demands. The modern population of the same Central Asiatic region has an average index of 86.0 (Joyce, according to Gerhardt, 1937-38). The only brachycephalics so far known from early times are found among the Kansu skulls of the Æneolithic, the Early Bronze and the Copper Age, excavated by Gunar Andersson and described by Davidson Black (1925, 1928). Unfortunately, Black (1928) gives only the average indices of 25 male skulls of the Neolithic period and 41 male skulls and 14 female skulls of the Bronze and Copper periods. These indices are 75.4 for the first period and 76.8 for the second. In an earlier paper (1925) Black reports that the index varies from 69 to 90, but how great the percentage of brachycephalics is not revealed. Black states, however, that all skulls, regardless of their index, are typical Mongols. Ninety-six skulls of the recent north Chinese population measured by Black have an average index of 77.5. It is, therefore, evident that the early brachy- and hyperbrachycephalic center sought for was not in north China.

Therefore, the search for this center through the Near and Far East and Central Asia is negative. Neither in prehistoric nor in early historic times can a population be traced, which can be considered as the source of the brachycephalic "infection" of Europe. Brachycephalics were almost everywhere in Asia, but they did not constitute a greater percentage of the whole population than they did in Europe before the supposed invasion. There is, therefore, no reason to make the Asiatic brachycephalics responsible for the increase in Europe, or one must assume that only the brachycephalics migrated from Asia while the dolicho- and mesocephalics remained at home.

The fundamental mistake of the whole problem lies in the fact that the skull index has been considered as a criterion sufficient to

determine racial character. When it became obvious that this was doubtful, it was necessary to look for other features to find whether the European brachycephalics really present a human form different from the European dolichi- and mesocephalics. Hug (1939-40), who recognized the decisive nature of this question, concluded that the facial bones of his material from Switzerland and south Germany show only those differences which depend on the form of the brain case as, for example, differences in the relation between the breadth of the face and the breadth of the brain case. As to the face as a whole he states: "The individual groups [see Tables 3-5] differ much less from each other in their facial bones than in those of the brain case" and furthermore "the face is in general less involved in the process of brachycephalization." Nevertheless Hug finally disregards the result of his own investigation: "A description and explanation of brachycephalization can undoubtedly be achieved without any reference to racial differences." This certainly is a mistake. For if the brachycephalization of Central Europe is due to an interbreeding of "autochthonous" dolichocephalics with immigrated alien brachycephalics who come from Central Asia, one can rightly suppose that not only the skull forms but also the faces must have differed and that some traits of the latter have been transmitted to the "hybrids" in addition to the allegedly transmitted skull index.

M. Reicher (1913-14) furnished a very illuminating contribution to this problem. He compared 57 Disentis skulls from Grisons (Switzerland) with a collection of 178 Mongolian skulls. The index of the Disentis group, which comprised dolicho-, meso-, and brachycephalics, varied from 72-90, with an average index of 84.2. The average of the greatest breadth in the Disentis group was 147.8 mm, in the Mongolian 146.9 mm. Reicher found the occiput was short in both cases and vertically flattened, and the degree of its inclination, on the whole, as well as that of the two scales which compose the occiput, the same. But while there was a considerable conformity between the Occidental and the Mongoloid brachycephalics, so far as the form of the brain case was concerned, decisive differences occurred in most of the features of the face. The Oriental group exhibited Mongoloid traits in the configuration of the cheek and nasal bones, and the upper jaw was more protruding than was the case in the Occidental group. From these facts Reicher deduced:

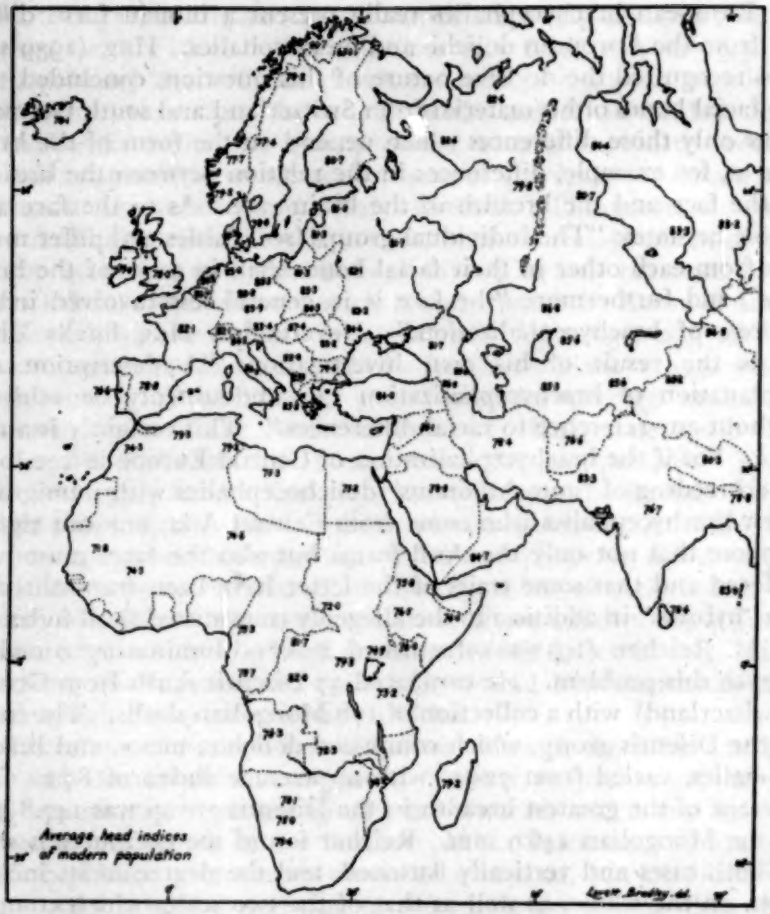

Fig. 9. Map of Europe, Africa, West and Central Asia with average head indices calculated according to the latest figures published by Gerhardt (1937-38).

FIG. 10. Map of East Asia, Australia, and Oceania with average head indices calculated according to the latest figures published by Gerhardt (1937-38).

identical brachycephalic forms probably developed independently of each other in each group, under similar or different influences which led, however, to the same result. In the opposite case, that is, if a common origin of both groups be supposed, it would be difficult to explain why the conformity has been maintained only in the brain case and confined to it alone, while great differences took place in the originally identical form of the face.*

The shortcomings of anthropological techniques caused this question to arise again after so many years of effort to characterize racial peculiarities of the skull. Most of the racial characteristics are of a non-metrical nature, and, therefore, much more difficult to determine than measurable features of which the skull index is technically the most tractable. Moreover, the latter can easily be taken from living individuals and directly compared with the corresponding measurement of the skull. It is chiefly this convenience to which the index owes its credit as an indicator of racial distinction. In reality, dolichocephalics, mesocephalics, and brachycephalics are found in almost all main racial groups over the whole world, although the frequency of their occurrences varies, in particular so far as the higher degrees of brachycephaly are concerned. Nobody ever suggested that all dolichocephalics are related to each other because of the common dolichocephalic form of their skulls, although there were never any scruples to regarding all brachycephalics, otherwise different, as closely related.

A glance at the distribution of skull and head index over the earth (cf. Figs. 9 and 10) shows that there are brachycephalic centers in East Asia, Africa, and America which even the most ardent defender of the theory of a common origin of the brachycephalics cannot explain in this way. Ariëns Kappers spent many years unravelling the intricate relationship of certain racial groups of the Near East and Europe on the basis of the skull index only. Yet he was finally forced to admit that not all brachycephalics of the world are traceable to *one* source. Here are some of those cases he refers to: All the tall Melanesian and Indian melanoderm tribes are dolicho- and mesocephalic. But among the pygmies living next to these groups there are tribes which are as a whole brachycephalic (the Mincopies of the Andamans, the Baining of New Britain). Brachycephalics are also found among the Aëta of the Philippines and the

*Translated from the German.

Pesechem of New Guinea. Yet according to Ariëns Kappers (1939b) the brachycephaly within these pygmy groups is the result "of the gradual change from a mesocephalic to a brachycephalic type." Kappers also assumes such an index change for the Malays whom he divides into the "more primitive and less brachycephalized and the less primitive and more brachycephalized" groups. The first group, the Proto- or Palaeo Malays of Malacca, the Djambians, and the Menang Kabau show a peak in their index curve at 78 and two others at 82 and 84, while the second group, the Lao and Tai of Siam, the Madurese, Sundanese, and some Javanese, have lost the primitive curve elevations and acquired a new one at 86 or 88. These more brachycephalized groups represent the Deutero- or real Malays. The third case to which Kappers has referred (1936a) concerns Africa. Meso- and brachycephalics are rare on this continent. Brachycephalic groups are confined to the central Congo basin and the Cameroons. Their presence could have been explained by their migration from Central Asia with as much justification as in the case of the European brachycephalics. And really, it has been done. But Ariëns Kappers (1936) concedes that

> the meso- and brachycephalic indices in the Central Congo basin and the Cameroons, though giving peaks analogous to those on the Asiatic mainland, Indonesia and New Guinea may be equally well explained by the fact that under special conditions analogous index peaks may arise in different countries and races, or in other words, that in its differentiation the human skull has a tendency to prefer certain relations between breadth and length, a feature also shown by the great constancy of the 79, 81, 83, and 86 peaks with some Eurasian peoples. . . .

Thus Ariëns Kappers reasserts an idea which he first advanced in 1935 when he suggested that the ultrabrachycephalic index peak of 89-90 within Eurasian brachycephalic groups, with average indices from 83 to 86 represents, "a mutation caused by special, probably environmental or endocrine circumstances." It is difficult to understand why an index change in a population from dolicho- or mesocephaly to brachycephaly (from indices of 75.0 to 79.9 or from 80.0 to 83.0) should be due to an immigration of alien racial elements as has been claimed for Europe, while it indicates progressive development or mutations in an otherwise homogenous population outside of Europe when the skull index jumps to 86 and 89. Construc-

tions like this only prove the failure of the substitution theory, and, on the positive side, that the skull index cannot be used as an indicator of racial differences as the majority of anthropologists have taken for granted. However, this does not exclude the possibility that under certain circumstances racial differences also involve the skull index. For instance, the Australian natives and the Mongolian Buriats undoubtedly represent two races. As Figure 11 shows, the differences between them include the skull form. The Australians are dolichocephalic, their index curve extending from 63 to 79 with the highest peak at 69; the Buriats are brachycephalic, their index curve extending from 75 to 95 with the highest peak at 87. There is almost no overlapping of the curves, in obvious contrast to curves

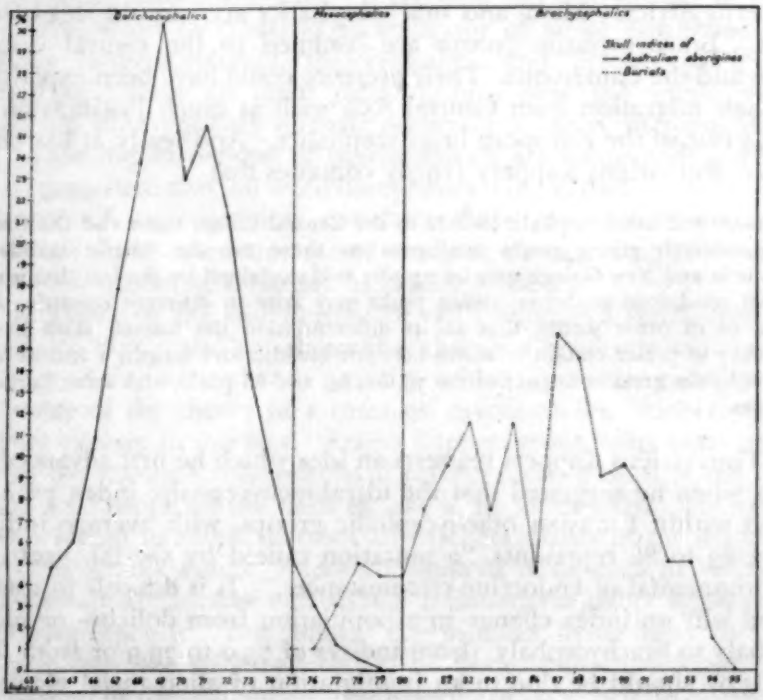

FIG. 11. Frequency curves of Australian natives (solid line) and Buriats (dotted line) after Ariëns Kappers (1936 b, Table 1, 25, and 1939 a, Table 1, 17).

of ancient or recent European populations (Figs. 6 and 8) where the curves cover dolicho-, meso-, and brachycephalics at the same time. But in the Australian-Buriat case the skull index is only one of many other clear differences. In the case of the early European population the index represents the only characteristic difference.

It is interesting that the conditions of the American Indians show a certain parallelism to those of the European population. Among the Indians all over the Americas there are dolicho-, meso-, and brachycephalics. The question is whether each group of these index categories migrated as such from Asia or whether the brachycephalics developed from dolicho- and mesocephalics after they settled in the Western hemisphere. Ariëns Kappers (1935) believes that all the brachycephalics came from Asia, the brachy- and hyperbrachycephalic groups, with an index from 83 to 86, making their way via the Aleutian Islands and the mesobrachycephalic groups, with an index from 79 to 81, via the Bering Islands.

According to Dixon (1923), dolichocephalics were the first immigrants into America and brachycephalics the last. He infers this from the distribution of the skull forms over the American continent. Those Indians who are marginal in a certain area are to be regarded as the earlier comers because they were pushed to the periphery by newcomers who occupied the more favorable lands in or near the center. Thus, the dolichocephalics settled in the northern and northeastern coast of the North American continent, Greenland, and the region east of the Great Lakes, while the brachycephalics extended entirely across the continent from British Columbia to the Gulf of St Lawrence and northward between the Rocky Mountains and the Great Lakes. Hooton (1930) agrees with these ideas of Dixon on the basis of archaeological evidences. "The prehistoric population of the Iroquoian area were long-headed but some of the modern Iroquois are brachycephals." The strongest body of evidence is that derived from the Southwestern area of the United States where the long-headed Basket-Makers were succeeded by the brachycephalic Pueblo peoples. Hooton opines that the dolichocephalics, who themselves represented the first wave of invaders from the Asiatic continent, were a general melange of strains fused together before their departure, while a second wave brought the brachycephalics. Thus the question whether brachycephalics devel-

oped from primarily dolichocephalics in Asia before their migration into the New World, or whether they developed in America itself afterwards, is still open for discussion.

A survey of the distribution of the skull index of the peoples of the Old World based on the latest figures of the anthropological census provided by Gerhardt (1937-38) reveals the irregularity of distribution of the three index categories and the impossibility of finding a common origin for the brachycephalics. In the maps (Figs. 9 and 10) the average indices of the population of the best known territories are indicated. Tables 7 and 8 give additional data. All racial or other groups not listed in the tables are mesocephalic.

None of the European nations, as defined by the frontiers of the territories they held before this war, had an average dolichocephalic population. Even an average mesocephalic index is in the minority and restricted to Norway, Sweden, Iceland, Great Britain, Portugal, and Spain. All the rest are more or less brachycephalic. In Asia the conditions are in principle the same: brachycephalic countries and

TABLE 7.

Dolichocephalic groups of the Old World

Continent	*Peoples*	*Average indices*
Australia	Some tribes of aborigines	68.8 to 72.7
Oceania	Some Papuan tribes	71.0 to 74.0
	Loyalty Islanders	72.5
	New Caledonians	72.1
	Caroline Islanders	71.3 to 73.6
Asia	Sikhs and other Indian tribes	71.6 to 74.5
Africa	Tuaregs	71.8
	Gallas	73.0 to 74.0
	Masai	70.6
	Dinka	70.4 to 72.8
	Shilluk	71.4 to 71.7
	Hottentots	72.9 to 73.4
	Arabo-Berbers	72.4 to 74.9
Europe	Some regions in the Mediterranean area	——
	Some regions in the Great Britain-Scandinavian area	——

TABLE 8

Brachycephalic groups of the Old World

Continent	*Peoples*	*Average indices*
Australia	None	
Oceania	Pygmies of New Guinea	83.4
	Baining of New Pommern	83.5
	Palanese	82.1
	Hawaiian	82.9 to 84.0
	Tahitians	85.0
Indonesia and Asia	Javanese	82.5 to 87.2
	Malays	82.2 to 84.9
	Macassars	82.1 to 87.0
	Philippines	82.3
	Andamanese	82.0 to 83.5
	Siamese and Annamese	82.7 to 87.3
	Burmese	82.1 to 84.3
	East Afghans	85.0 to 87.0
	Some Arab tribes	82.6 to 84.7
	Many tribes in Central and Northwest Asia	82.4 to 89.4
	Aleutians	83.6 to 84.0
	East Siberians	82.8 to 85.3
	Manchus	86.8
	Coreans	83.7 to 85.5
Europe	Some Tartar tribes	85.1 to 87.1
	Almost all Caucasian peoples	81.9 to 87.6
	Carnelians	82.2
	Some Great Russian groups	81.6 to 83.2
	Lithuanians	81.6 to 82.6
	Ukrainians	82.2 to 85.7
	Poles (East and South)	81.6 to 85.1
	Greeks	81.6 to 88.1
	Macedonians and Bulgars	80.5 to 87.2
	Vlachs	82.9 to 86.3
	Albanians	82.6 to 90.8
	Montenegrins	86.0 to 88.6
	Bosnians	85.7
	Czechs	82.4 to 85.7
	Sudeten Germans	84.0 to 85.3
	Hungarians	81.5 to 89.0
	Carinthians	81.7
	Tyrolese	82.2 to 84.7
	Austrians	82.6
	Swiss	81.5 to 87.0
	Bavarians	84.1

Württembergians	83.8
Badenians	83.6
Rhinelanders	82.2
Thuringians	83.8
Silesians	84.6
West Prussians	81.7 to 82.3
Mecklenburgians	82.5
Lapps	82.8 to 86.5
Auvergnats	83.2 to 85.5

tribes prevail; some are mesocephalic but surprisingly few are dolichocephalic. In the Sunda Islands and the Melanesian and Polynesian islands, about 16 per cent of the groups measured have an average dolichocephalic index, 58 per cent a mesocephalic index, and 26 per cent are brachycephalic. The reported figures give only a very approximate idea of the real conditions. Some of the groups comprise only a small number of individuals while others contain a great many. In addition the grouping on the whole is more or less accidental and arbitrary.

But the fact remains that the overwhelming majority of the population of the earth is not dolichocephalic but mesocephalic and brachycephalic. In view of this the theory which considers the dolichocephalics and the brachycephalics as "pure" and different races, and the mesocephalics as their product by hybridization, is absurd. So is the idea that all brachycephalics are related to each other. If this were right, why should it not hold good for the dolichocephalics, too? To suppose that the people of the Auvergne in France are more closely related to the Javanese than to the people of the Dordogne because the former pair have the same brachycephalic index, while the latter are dolicho- and mesocephalic is tantamount to the eventual claim that the population of Södermanland in Sweden are closer kin to the Australian natives than to the people of the Fanö Island because the former are dolicho- and mesocephalic and the latter brachycephalic.

The maps (Figs. 9 and 10) reveal that modern mankind tends toward mesocephaly and brachycephaly when compared with earlier types which inhabited the world during the Palaeolithic and even Neolithic times. This is an important fact. It means that the skull form of modern man has changed by shortening and widening the

brain case, and that this process evidently went on also in protohistoric and historic times and may continue even today. This does not necessarily exclude the fact that, in certain instances, dolichocephaly, on one hand, and brachycephaly, on the other, are bound to special racial groups and that, therefore, under certain circumstances an increase of brachycephaly may have been or still is due to an influx of alien racial elements. Yet such an occurrence does not affect the main issue. If Homo sapiens as a whole tends to change the form of his brain case, this process may happen in two ways. It may occur under the form of individual variations within a racial group which is uniform with regard to other features, or it may involve a group which is already distinguished from others by having produced special differentiations in other features. If mankind represents one species and an exchange of genes is possible, few individuals may be able to transmit newly acquired characters with or without other specializations, particularly in the case where those characters represent evolutionary steps.

V PROGRESSIVE BRACHYCEPHALIZATION AS EVOLUTIONARY PROCESS

Homo fossilis as a whole was dolichocephalic although there were some mesocephalic and brachycephalic forms. Recent man shows a tendency to become more and more brachycephalic. The development of hyperbrachycephalic forms seems to be the latest step in this direction. This implies that the increase of the index is the result of an evolutionary process which did not stop when the form of modern man was achieved but continues even today. This leads us to the question as to which factors may be responsible for such a gradual brachycephalization of the human skull.

The index increases when the length of the braincase becomes reduced or the breadth increased or when both factors act together. This, however, is just the way the transformation of the skull has taken place from the earliest human type of which we have knowledge up to the type of modern man. The decrease of the original length is 12 per cent greater than the reduction in breadth, as has been shown above. The braincase of modern man is, therefore, shorter but relatively broader than the original form. The change is accompanied by a reduction of the basal length due to the deflection of the base as described earlier (cf. Fig. 3). Table 9 shows the

length of the skull base in the different stages of evolution. Even in historic times the deflection of the base has increased, as expressed in the shortening of the length of the skull base coincidentally with an increase of the breadth and, of course, of the skull index (cf. Tables 3-5).

The transformation of the skull is paralleled by an increase of cranial capacity until the phase of Neanderthal man has been reached. The cranial capacity of Homo fossilis varies from 1230 to 1710 cc, the average being 1500 cc. The preceding phase—the Neanderthalians—varies from 1270 to 1610 cc with an average of 1400 cc. In modern man the capacity ranges from 910 cc to 1915 cc with an average of 1350 cc. Although the figures obtained for Homo fossilis and Neanderthal man have but slight weight because of the scarcity of material, they show that there is certainly not a conspicuous increase of the cranial capacity on the whole after evolution had reached the Neanderthal phase. Von Bonin (1934) calculated an average capacity of 1446 cc for modern Europeans and 1501.7 for extinct Europeans. He infers from these figures that "in Europe since prehistoric times the capacity of the skull has decreased" and that "no further increase has taken place since the time of Neanderthal man." As Neanderthal man and Palaeolithic man were dolichocephalic and modern mankind meso- or brachycephalic, it is justifiable to state that, in any case, the increase of brachycephaly in modern times has not been accompanied by obvious signs of an enlargement of the brain. The dolichocephalic Australian natives have an average cranial capacity of 1230 cc, while the Eskimo with the same

TABLE 9

Length of the skull base (nasion-basion) in millimeters

Homo soloensis	113.5*
Neanderthalians	111.0*
Recent Europeans:	
Iron Age	103.7
Roman period	100.7
Early Medieval	101.4
Late Medieval	99.2
Recent times I (16th-18th Centuries)	99.0
Recent times II (19th Century)	98.9

*After Weidenreich, 1943; all other measurements after Hug, 1939-40.

skull form have one of 1510 cc. That the size of the brain is independent of the form of the braincase is also proved by the observations of Sarasin (1916-22) who found the cranial capacity of the Loyalty Islanders, with an index of 72.5, distinctly greater than that of the New Caledonians with an index of 72.1. Of the brachy- and hyperbrachycephalic groups, the Javanese have an average capacity of 1490 cc and the Tyrolese one of 1425 cc. Hug (1939-40), who compared the capacities of skulls of the different epochs listed in Table 5, arrived at the conclusion that the capacity has scarcely been affected by the change in the character of the skull form (Fig. 5). Pearl (1905-06), as already mentioned above, found no difference between dolichocephalics and brachycephalics within the same population.

The remarkable fact that the evident change of the cranial form from dolichocephaly to brachycephaly was not coincident with an increase of brain size proves that factors other than the expansion of the brain were involved in this process. Hug (1930-40) discussed all factors ever held responsible for the change: geographical, climatical, social, nutritional, and mechanical. He comes to the conclusion that the hereditary conditions of the skull form and the influence of environment on it must be more thoroughly studied before the problem can be solved. Although I do not underestimate the value of investigations of this kind, I doubt whether they will bring us much further unless the principle of human evolution is generally recognized and acknowledged. It is already certain that the thorough studies Frets (1921) made on the heredity of the skull index were in vain. He did not reach conclusive results. In his own words:

> The head indices of parents may have a very different hereditary composition. There are many families where the indices of children surpass those of parents either upwards or downwards, but there are only few families where the head form of parents and children has the same hereditary composition. . . . It appears that there is a large non-hereditary variability.

In other words the heredity of the skull index does not follow the Mendelian rules as was expected. Schreiner, who was as unsuccessful as Frets in finding rules of inheritance, resignedly admits that the features on which the skull index is based are of a very complicated nature. She admits also that the definitive skull form is, in

many cases, not determined by one feature only. Furthermore she recognizes that the "skull index is much too crude a clue to be used alone in travelling through the maze of racial affinities."* Genetically-minded people, who accept results only if they are secured by experiments, artificial or natural, may appreciate the reference to one of her observations according to which one twin of the Siamese type had a head index of 80.8 while the other had one of 85.5. If the skull index were a reliable indicator of racial differences these identical twins must be attributed to two different races because one is mesocephalic and the other brachycephalic.

The negative results of Frets and Schreiner are not surprising. As has been shown in the second section of this paper, the skull index is only a numerical expression of the relation between length and breadth of the braincase. Each of these features can certainly be inherited independently. But in addition, length and breadth themselves are very compound features which involve many different factors. Therefore, all efforts to find out the hereditary of such a complexity are doomed to failure.

It may well be that the conditions of life and nutriment—dearth or abundance of iodine or calcium or other substances—influence the skull form of individuals. In an earlier paper (1925) I have discussed these possibilities. It may also be that a constant pressure on the occupit by the use of special devices such as fixing the skull of a baby on a wooden board or a mattress leads to a flattening of the skull and produces brachycephaly similar to that achieved by intentional deformations. But I do not believe that those more or less accidental interventions, which involve only certain individuals or groups, can be made responsible for the brachycephalization of the whole of mankind in the course of time. The ultimate cause must be a more general one and of a permanently effective nature.

In this connection, it is not irrelevant that other changes in the morphological character of the skull have been observed beside brachycephalization. The most obvious but least studied are the changes which the human face has undergone since late Palaeolithic times. The face of a Palaeolithic man has a quadrangular contour; its bones are very massive and the individual features coarse and heavy. This general character may have been preserved more or less

*Translated from the German.

in certain races and individuals of today, but the facial bones of modern mankind as a whole are more fragile and the individual traits are more refined. Everybody is conscious of these facts but very few students have taken the pains to make detailed records of them. Thus the few data available are the more important. Morant (1935) studied predynastic Egyptian skulls from Badari and compared them with later Egyptian skull series. His conclusions are that with the advance of time the human type of the predynastic era changed by becoming less prognathous and acquiring a lower nasal and a higher cephalic index. "A slow progression in the same direction appears to have continued throughout the whole of the dynastic era and down to Roman times in Upper and Middle Egypt at least."

The most interesting fact revealed in this communication is the correlation which Morant observed between the increase of the cephalic index, the decrease of the prognathism, and the narrowing of the nasal aperture. These are indeed the features and changes which we have to expect when the trend of human evolution, as revealed by the earlier stages, still continues in modern mankind. I know very well that a high degree of prognathism, even exceeding that found in early man, may occur in certain racial groups or certain individuals of present time. But as a matter of fact this prognathism is not the kind found in early man but represents the so-called alveolar prognathism which is combined with "prodenty," and is probably a late differentiation. As I have shown in earlier publications (1941, 1943) there is a close correlation between braincase and face which can but be summarized by the statement: the smaller the braincase the larger the face and the larger the braincase the smaller the face (cf. Fig. 3). The evolutionary process in man which leads to a gradual expansion of the braincase and a corresponding reduction of the face produces an alteration in the topographic arrangement of these two components of the skull at the same time. In the original arrangement the face, as represented by the jaws (snout), is placed before the braincase as in all quadrupeds. In the definitely human form the enlarged braincase occupies the top of the skull while the reduced face underlies the braincase. This results from the adoption of erect posture, the increasing deflection of the base of the skull, and the shortening of its basal length, as proved by measurements given above. This process did not stop

even when the modern human type of skull had been attained; it still goes on. The tendency of the skull to assume a globular form by widening the braincase and reducing the face (i. e. the length of the jaws) is the true factor responsible for this brachycephalization. It did not come to a standstill when the brain itself stopped expanding.

The evolution of the human skull is determined by two factors: one is the expansion of the brain and the other the adaptation to erect posture. Although both go hand in hand, they are independent of each other to a certain extent. The expansion of the brain has caused the human braincase to assume its characteristic form, regardless of any relation between its length and breadth. This same cause has produced the general increase in height and breadth above the base (a point discussed earlier), has reduced the massiveness of the braincase, and caused the disappearance of those superstructures which particularly affect the length of the skull and shorten the face. That this morphological transformation is really the result of the increase of the brain and its need for more space is proven by the differences in brain size and skull form between large and dwarf forms of the same species. As I have shown earlier (1941), large dogs like Irish wolfhounds have long and narrow brain cases and relatively small brains while dwarf dogs, like King Charles spaniels, have short and wide brain cases and relatively large brains. In addition, the former have long protruding snouts while the latter have short reduced ones. In the first case the size of the brain is small in proportion to the size of the body, its weight representing only the 355th part of the body weight. In the second case the brain is large, its weight representing the 31st part of the body weight. In other words, the relatively large brain of a dwarf dog requires much more space in the small skull than the relatively small brain of a large dog takes in the large skull. The result is that the braincase of the dwarf is expanded like a balloon. While the ectocranial index of an Irish wolfhound is 47, the index of a King Charles spaniel is 87, and that of an English bulldog, which is about intermediate in relation of size of brain and body, is 72. If dogs were classified according to their skull indices as man is, the Irish wolfhound would be ultradolichocephalic, the bulldog mesocephalic, and the King Charles spaniel hyberbrachycephalic. Parenthetically it may be

added that the dolichocephalic Irish wolfhound comes closer to the original wild type of dog than the brachycephalic King Charles spaniel does.

In spite of this extraordinary enlargement of the braincase and the reduction of snouts in dogs, there is no essential change in the topographical relation between braincase and face. As in all quadrupeds the face remains placed before the braincase, although it is considerably reduced in size. The deflection of the small base and the shift of the face below the braincase is a human peculiarity caused by the adaptation of the body to erect posture (Weidenreich, 1924). The trend of the whole skull toward a globular form is still recognizable even when there is no longer a general tendency for the braincase to enlarge. Von Bonin (1934) suggested that evolution now aims at an internal organization of the brain rather than at its expansion. If this is so, and all indications point in this direction, the silliness of the year-long debates about the mental qualites of dolichocephalics and brachycephalics appears all the greater.

VI SUMMARY

1. The skull index, i. e. the length-breadth index of skull and head, is only the numerical expression of the relation between the extension of the braincase in longitudinal and transverse directions. It depends chiefly, therefore, on these two factors. The braincase as such is, however, a very complex structure; not less than eight individual cranial bones are involved in its formation. Six of these again are composed of several smaller units. All these constituents influence length and breadth of the skull and, consequently, the value of the index. Any racial classification of man based only on differences in the values of the skull indices neglects these bare morphological facts.

2. Length and breadth measurements taken from the outside of the braincase (ectocranial index) coincide neither in the location of the landmarks nor in their values with the length and breadth of the cranial cavity (endocranial index). In general the endocranial indices tend more to brachycephaly than the ectocranial ones except for ectocranial indices over 80. These differences are due to the variable thickness of the cranial bones, particularly in those areas

where the anterior and posterior landmarks of the braincase are located. An individual who has been assigned to a certain race on the evidence of the ectocranial index may belong to another race on the basis of his endocranial index. Reading mental qualities of races from ectocranial indices is only a revival of Gall's phrenology but has even less biological foundation than the latter.

3. The theory which considers dolichocephalics and brachycephalics as exponents of two distinct races and mesocephalics as the result of their hybridization originated from the alleged observation that in prehistoric and early historic times Europe was almost exclusively inhabited by dolichocephalic peoples while mesocephaly and especially brachycephaly increased more and more from the beginning of the Middle Ages. According to this theory the result was that the average index of the present European population has turned brachycephalic. This process has been attributed to open or surreptitious immigration of alien brachycephalic racial elements from the east. These alien races have been identified with Mongols. If this theory is true, one should find: (1) pronounced brachycephaly in an increasing number of individuals all the way from Central Europe to Central Asia from the time the invasion set in; (2) typical Mongol racial features in addition to the brachycephalic index among the peoples of the invaded territories. Yet so far no brachycephalic centers have been discovered either in East Europe or in West and Central Asia. The skulls of prehistoric and early historic times recovered from all the regions concerned are for the greater part dolicho- or mesocephalic and their percentage of brachycephalics is not greater than that of the original "infected" population of Europe. Furthermore, a comparison of the skulls of the "brachycephalized" Europeans with "genuine" brachycephalic Mongols of Asia reveals that their skull forms are the same. But no Mongolian traits can be discovered in the facial skeleton in any of the periods concerned.

4. The phenomenon of earlier types of modern mankind being dolichocephalic while later ones are meso- and brachycephalic is not confined to Europe. It is found in the whole of mankind regardless of any racial differences. What we know of early man in Africa and Asia proves that he was dolichocephalic with slight leaning

toward mesocephaly, while the overwhelming majority of modern mankind is meso- and brachycephalic. The only continents where dolichocephalics prevail are Australia (Australian aborigines) with an index of 74.2 and Africa with an index of 75.7. Europe with an average index of 81.8 and Asia with an average index of 83.3 are inhabited mainly by brachycephalics. Oceania with an average index of 78.0 is mesocephalic. America as a whole is mesocephalic with leaning to brachycephaly and may be ranged between Oceania and Europe. The idea that brachycephaly has developed in *one* Asiatic center whence it has been transferred to the whole, otherwise dolichocephalic, world, producing mesocephalics by interbreeding, is absurd. Even the most convinced adherents of this substitution theory concede that not all occurrence of brachycephaly can be explained in this way. They agree that certain brachycephalic groups in Europe, Asia, and Africa must have become "mesocephalized" and "brachycephalized" in the course of time. If this is so, it is hard to understand why such a process could not have taken place in other cases also. All investigations made to find the rules which may govern the heredity of the skull index resulted in the discovery that no such rule is generally valid. The skull index as such cannot be inherited, apparently because its two main factors, skull length and skull breadth, follow different lines. The original assumption that mesocephalics are the products of interbreeding between "pure" dolichocephalics and "pure" brachycephalics is nonsense.

5. Brachycephalization is the result of the transformation of the braincase and the entire skull in the course of human evolution. This process brings the expanding braincase from its original position behind the face to the front and top of the skull. The face takes its place below the braincase, while its size becomes reduced in correlation with the expansion of the braincase. This process reveals the tendency of the skull to assume a globular form by drawing the posterior end of the braincase (occipital opening; see Fig. 3) nearer to its anterior end (forehead). The morphological expression of this "rolling up" of the skull is a deflection of the base. This is a characteristic human feature and apparently a consequence of the adoption of erect posture which brings about a change both in the form of the spinal column and of the skull base.

6. The expansion of the braincase shortens its length chiefly by reducing the superstructure (supraorbital and occipital tori) on which the landmarks for the measurement of the greatest length are located. When the phase of modern man is reached, the shortening of the length of the braincase is nearly completed. All available data indicate that modern man possesses no greater cranial capacity (and, therefore, no larger brain) than the immediate preceding phase, Neanderthal man. The expansion of the braincase practically came to a standstill when the latter phase was reached. The increase of the braincase in width (brachycephalization) observed in modern man cannot have been brought about by the expansion of the brain. This is proven by the fact that dolichocephalic and brachycephalic skulls of the same population show the same average capacity. But the "rolling up" of the skull still goes on. Brachycephalization, therefore, means a better adjustment of the skull to the conditions of the erect posture by adopting a more complete globular form.

7. Brachycephalization is an evolutionary process which involves all mankind. It is not confined to certain races or groups, as is shown by the fact that brachycephalic skulls occur everywhere—only the degree and the number of individuals varies. It obviously makes its appearance as an individual variation, and it may well be that it is more common in certain groups at a certain time than in others. External factors, whose exact nature is unknown, seem to favor the spread of brachycephalization over the world.

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THE PROBLEM OF CONTACTS BETWEEN THE SOUTHWESTERN UNITED STATES AND MEXICO

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THE PROBLEM of relationship between the people of the Southwestern United States and Mexico presents two related aspects: the one, ethnographic; the other, archaeologic. Considerably more has been done with the former in the nature of systematic and theoretical discussions than with the latter.

Beals' excellent paper and subsequent reflections[1] and Kroeber's analysis[2] have impressively set the pace. On the archaeological side, however, the lack of documentation *per se* and the desultory nature of the studies until very recently have offered few data to stimulate much productive thought. Vaillant's paper[3] dealing with ceramic resemblances of Central and North America is perhaps the only extended venture in the archaeological field. Yet the question of relationship is no less important today than it was then to reach an understanding of the more strictly local problems in the respective areas.

It is not the intent of this paper to present a complete analysis of the resemblances between the areas of high culture developed in Mexico and the Southwest. The chief purpose is to examine briefly a few of the angles and to draw certain inferences. If these prove to be of a controversial nature and as a consequence promote further discussion, or better still, if some fresh archaeological work should be undertaken with the intention of shedding light on this knotty problem, my purpose will have been served.

Many American archaeologists have come to accept as a matter of course the doctrine that many Southwestern culture elements were derived from Mexico. The extreme view has been that Southwestern cultures were little more than marginal and thrice removed radiations from southern centers. These ideas were advanced at a time when the chronologies, and even the patterns of culture, of the

1 Beals, 1932; 1943, pp. 245-252.
2 Kroeber, 1928.
3 Vaillant, 1932.

respective areas were imperfectly known, all of which made the equation of horizons most difficult. The development of tree-ring dating as a means of adjusting the Southwestern sequences to absolute time and Gila Pueblo's excavations at Snaketown, throwing much new light on the Hohokam Culture, caused Gladwin to revolt against what he called "dogma," and to reorient his whole point of view, expressed in Volume II of the Snaketown report.[4] This skepticism on his part has had its good effect inasmuch as current workers are exploring the various possibilities much more critically than before. Contrary to my own early leanings, somewhat in line with those of Mr Gladwin, I have reverted to the original premise that the main flow of culture elements was from south to north, beginning with such basic factors as agriculture and pottery. I am willing to concede, however, that house building was so generic a feature and so environmentally determined that its evolution was largely local (as can be shown) after the introduction of the pit house, probably from the Old World. Adherence to the view expressed above does not mean that local peoples were poorly disguised groups of southern tribes or that there was wholesale emigration from Mexico. The Southwestern agricultural peoples should be viewed as having had roots in the demonstrably older pre-agricultural horizons of the Southwest, so far unmatched by any evidence from central Mexico, and who, when the time came, benefited, to a greater or lesser degree, by transmissions from the fast developing southern centers.

The traits which I believe to be traceable to Mexico were borne by all methods of cultural transmission, from the diffusion of ideas from group to group to the importation of actual objects probably by traders. The weakness in the problem has been our lack of knowledge of northern and especially northwestern Mexico, the *terra incognita* and the way out of many an archaeologist's dilemma. But even this area is gradually assuming its proper place in the complex history of early America. The growing body of literature, while accounting for some things which are there, also is giving us some indication of what is not there. The works of Sauer and Brand,[5] Sayles,[6] Kelly,[7] Ekholm,[8] and others have lead to the single

4 Gladwin, 1937, pp. 15 *et seq.*
5 Sauer and Brand, 1931; 1932.
6 Sayles, 1936. 7 Kelly, 1938. 8 Ekholm, 1942.

conclusion that northwestern Mexico was not the main corridor through which the Mexican elements passed to infect the Southwestern cultures. But some sort of relationship did exist and whether this was through the lowlands of the coast or through the sierras remains to be determined. One wonders whether we are not looking for the perfect situation where the diffusion is traceable step by step, whereas a continuous diffusion, without break, need not necessarily have been the case at all.

Few will deny that Mexico and the lands to the south were initially peopled by southward drifting populations. But so far, Mexico has produced practically no evidence of the Paleo-Indian comparable to the patterns of Texas,[9] the Cochise Culture,[10] and the San Dieguito[11] complex, known now only north of the international line. This is not because they are absent to the south but because no consistent search has been made for them. The evidence of marine shells from the Gulf of California in the late Pleistocene or Early Recent layer in Ventana Cave, associated with a San Dieguito-Folsom complex is a good indication of the potential value of the west coast in this type of study. Chihuahua, with numerous inland basins, affords excellent chances for the recovery of early remains[12] and it is difficult to imagine that farther south the country is to be found lacking in such evidence. All of this may not be pertinent to the problem but I cannot pass over the subject without lamenting the gross neglect of a challenging field of American archaeology.

So far the evidence of contact is limited to the corn-growing peoples of both areas concerned, and the picture is complicated by the division and subdivision of the cultures. In the Southwest the single large, more or less homogeneous archaeological culture formerly assigned to the whole area has been broken down into at least three basic patterns, the Anasazi, the Hohokam, and the Mogollon, with a fourth, the Patayan, still little more than a suggestion. Each of these displays a complex set of relationships to the other. The role of Mexico must therefore be viewed from the standpoint of each of these and not from all collectively. In the all-important factor of

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9 Sayles, 1935.
10 Sayles and Antevs, 1941.
11 Rogers, 1939.
12 Brand, 1943, p. 164.

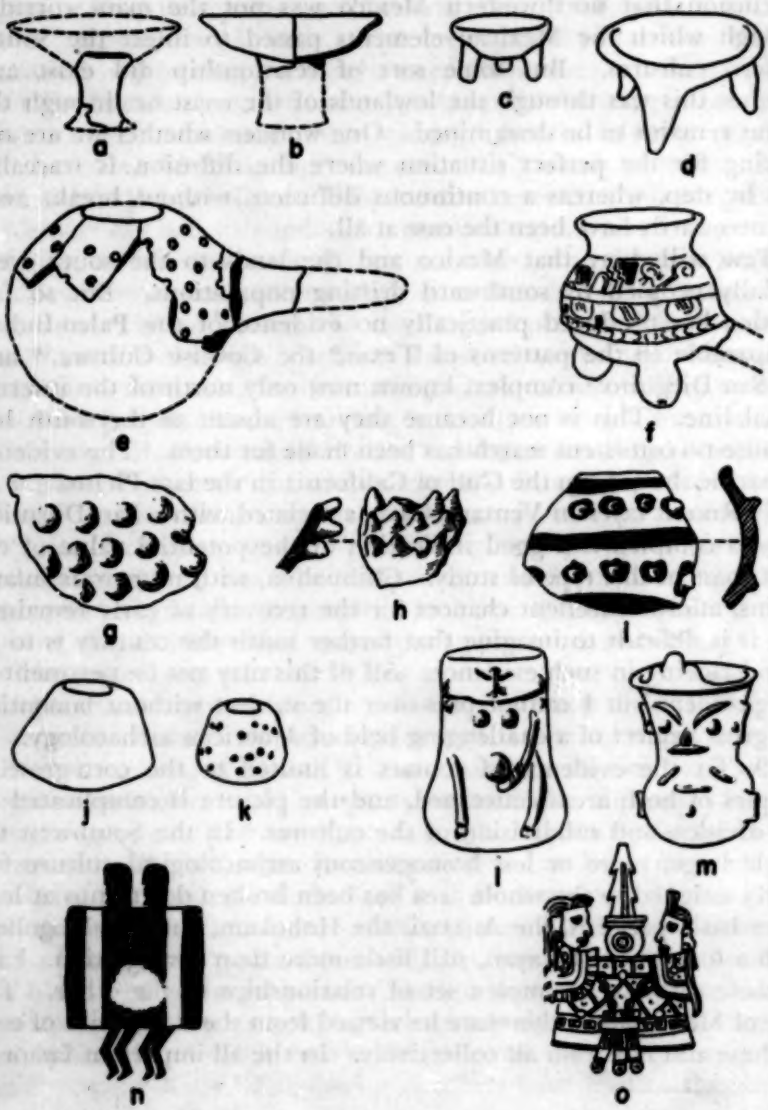

FIG. 1. Southwestern and Mexican archaeological objects.

calculating time, the Southwest has the edge over Mexico because of the successful application of tree-ring dating. But this should not cloud the issue by implying that Mexican cultures did not have antiquity or that high or higher planes of existence were not reached there earlier than in the Southwest. That this was so is self evident, I think, from the nature of the evidence.

The three basic Southwestern archaeologic cultures in which we may look for analogies with Mexico, as stated before, are the Anasazi, Mogollon, and the Hohokam. Geographically, the Anasazi, centering in northwestern New Mexico and northern Arizona, was farthest removed. Beyond the fundamentals of culture, as agriculture, pottery, and loom weaving with cotton, little of southern origin need be sought there although other isolated and less basic elements might be mentioned, as, for example, a few actual cases of importation.[13] The Mogollon Culture, centering in southwestern New Mexico and

13 The spindle whorl at Pecos (Kidder, 1932, pp. 143-144, 309), and the Oaxacan carved jade found at Awatovi (Brew, 1940, pp. 346-347).

EXPLANATION OF FIGURE 1

a Footed vessel, Red-on-buff, Snaketown, Gila Butte Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Fig. 78, *i*).

b Annular base bowl, dull red ware, Ticoman (Vaillant, 1931, Pl. 76, *l*).

c Tripod bowl, Red-on-buff, Snaketown, Sacaton Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Fig. 68, *c*).

d Tripod bowl, polished interior, Ticoman (Vaillant, 1931, Pl. 78, *a*).

e Handled censer, Plain ware, Snaketown, Snaketown Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Fig. 103).

f Handled censer, Xolalpan (Linné, 1934, Fig. 148).

g Bossed decoration, Red-on-buff, Snaketown, Sacaton Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 137, *b*).

h Bossed decoration, Gualupita (Vaillant, S. B. and G. C., 1934, Fig. 28, *m*).

i Bossed decoration, Black-on-white, Pinedale (Haury and Hargrave, 1931, Fig. 20).

j Heavy-walled vessel, Plain ware, Snaketown, Sacaton Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 188, right).

k Candelero, Teotihuacan (Linné, 1934, Fig. 164).

l Effigy vessel, Red-on-grey, Snaketown, Sweetwater Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 184).

m Effigy vessel, Xolalpan (Linné, 1934, Fig. 40).

n From a Mimbres Black-on-white bowl, Swarts Ruin (Cosgrove, 1932, Pl. 225, *e*).

o Codex Borgia 9 (Courtesy A. M. Tozzer).

FIG. 2. Southwestern and Mexican archaeological objects.

EXPLANATION OF FIGURE 2

a Hohokam figurine, Snaketown, Santa Cruz Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 197, *i*).

b Mogollon figurine, Bluff Site, Forestdale Valley (Arizona State Museum collection, No. A-2528).

c Basketmaker III figurine, Monument Valley (Arizona State Museum collection, No. 456).

d, e Figurines, Cuicuilco, Valley of Mexico (Arizona State Museum collection, Nos. 12906, 13733).

f Spindle whorl, Los Muertos, Civano Phase (Haury, 1945, Fig. 71, *g*).

g Spindle whorl, Chametla (Kelly, 1938, Fig. 24, *f*).

h Spindle whorl, Los Muertos, Civano Phase (Haury, 1945, Fig. 71, *l*).

i Spindle whorl (incised), Guasave (Ekholm, 1942, Fig. 17, *a*).

j Spindle whorl, Los Muertos, Civano Phase (Haury, 1945, Fig. 72, *e*).

k Spindle whorl, Guasave (Ekholm, 1942, Fig. 17, *q*).

l Spindle whorl, Teotihuacan (Linné, 1934, Fig. 238).

m Ear spool (schist), Snaketown, Sacaton Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 113, *d*).

n Ear spool (obsidian), Teotihuacan (Linné, 1934, Fig. 322).

o Nose plug (chalcedony), Cuernavaca (horizon unknown) (Arizona State Museum collection, No. 5527).

p Nose plug (basalt), Jackrabbit Ruin, Desert Hohokam, Sells Phase (Arizona State Museum collection, No. A-885).

q Nose plug (wood), Ventana Cave, on mummy, Desert Hohokam, Sedentary Period (Arizona State Museum collection).

r Chac-Mool-like figure, Hohokam, Snaketown, Snaketown Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 76).

s Chipped crescent, Hohokam, Snaketown, Sacaton Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 92, *a*).

t Chipped crescent, Teotihuacan (Linné, 1934, Fig. 313).

u Mano with overhanging ends, Desert Hohokam, Jackrabbit Ruin, Sells Phase (Scantling, 1940, Pl. 16, *c*).

v Mano with overhanging ends, Guasave (Ekholm, 1942, Fig. 20,*h;* see also Kelly, 1938, Fig. 27, *b*, for Chametla).

w Cross (green steatite), Gleeson (Fulton and Tuthill, 1940, Pl. 20, *a*).

x Cross (soft calcareous stone), Cuicuilco (Arizona State Museum collection, No. 13862).

y Shaped mortar (basalt), Hohokam, Snaketown, Santa Cruz Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 52, *a*).

z Shaped mortar (basalt), Teotihuacan (Linné, 1934, Fig. 261).

aa Figurine with vessel on head (pottery), Hohokam, Snaketown, Sacaton Phase (Gladwin, Haury, Sayles, Gladwin, 1937, Pl. 196, *a*).

bb Figurine with vessel on head (stone), Ticoman (Vaillant, 1931, Pl. 79, *c*).

southeastern Arizona, while in a strategic position to receive impulses from Mexico, had lost its identity everywhere by about A. D. 800, or before many of the specific and definitive southern elements appear in the Southwest. Here, too, only the most basic factors are involved. This leaves the Hohokam of southern Arizona to carry the brunt of any comparison and it was among them that evidence for contact is most concrete. To state this in another way, specific identities with Mexico lie mostly south of the Colorado Plateau; whereas northward the elements are of a more general nature. The few and isolated parallels among the Anasazi, as copper bells, ball courts, the fragment of mosaic mirror with cloisonné at Pueblo Bonito[14] were probably transmitted by the Hohokam and need not imply direct Mexican connections.

The standard approach to a problem such as this is to bring together comparable elements. This is an absorbing game but does not always lead one to the right conclusions. Both Vaillant[15] and Gladwin[16] have noted a number of these, realizing that the meaning is limited.

In the following list, supplemented graphically by Figures 1 and 2, some additional parallels are given. Let me stress again that no effort has been made to canvass the situation completely but merely to present enough of the general picture to guide to conclusions stated presently. The elements are divided into two categories on the basis of their general effect on the receptor groups: (1) the primary and fundamental elements which definitely lifted the plane of culture, and (2) the secondary elements which, while distinctive, added little more than frills to the culture of the receptor group.

Primary Elements:

Corn and corn culture:[17] to Hohokam, Mogollon, and Anasazi by about A. D. 1.

14 Vaillant, 1932, p. 9.

15 Vaillant, 1932.

16 Gladwin, 1937, as incidental to a study of analogies between the Old and New Worlds.

17 The mano and metate are not considered to have arrived with corn as antecedent milling stones were extensively employed locally by food-gatherers, as in the Cochise Culture. The adaptation of these to corn-grinding was a simple procedure. Had the metate come in with corn, it is likely that the legged form, early in Mexico (Vaillant, 1930, Pl. 46, 7; 1931, Pl. 89, bottom row, no. 3.) would have been represented in pre-Columbian times.

Pottery: first to Hohokam and Mogollon, by about A. D. 1, whence the germ spread (by about 400) to the Anasazi.

Cotton and (inferentially) the loom: first to the Hohokam (probably before 700) and quickly transmitted to the Anasazi by them.

Concept of stone carving in relief and in the full-round: primarily to Hohokam before 700, and restricted by them to carving miniatures, never for architectural decorations.[18] Rare among other groups.

Secondary Elements:

Ball courts: to Hohokam by about 800[19] and via the Hohokam to the Anasazi (Flagstaff area), by about 1050.[20]

Copper bells: to Hohokam and Anasazi, by about 1100.[21]

Macaw: chiefly to Anasazi, by 1100.[22]

Pottery traits:

Footed vessels: to Hohokam, before 700 (Fig. 1, *a, b*).[23]

Legged vessels: to Hohokam, by 700 (Fig. 1, *c, d*).

Handled censer: to Hohokam, by about 500 (Fig. 1, *e, f*).

Bossed decoration: to Hohokam, by 700, and via Hohokam to Anasazi (Fig. 1, *g, h, i*).

Candeleros: to Hohokam, by 500 (?) (Fig. 1, *j, k*).

Effigy vessels: to Hohokam, by 300 (?) (Fig. 1, *l, m*).

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18 Beyond certain religious elements of southern complexion which doubtless were pre-Spanish, as reasoned from modern survivals, there is little to show that the great emphasis on religious structures in Mexico affected the local groups in any way.

19 Gladwin, Haury, Sayles, and Gladwin, 1937, pp. 36-49; Chard, 1941.

20 McGregor, 1941, pp. 83-89.

21 Gladwin, Haury, Sayles, and Gladwin, 1937, pp. 163-165; Pepper, 1920, p. 269; Morris, 1919, p. 100.

22 Pepper, 1920, pp. 194-195, 375-376.

23 The illustrations of parallels from Mexico are admittedly selected at random. Similarities could be drawn from various Mexican groups and of varying horizons. The intention is to convey the idea that the elements are present in strength to the south.

Baking griddles: to Hohokam, by 1200.[24]

Pictorial elements:[25] to Anasazi (Mimbres), by about 1150 (Fig. 1, *n, o*).

Other clay objects:

Figurines: to Hohokam, Mogollon and Anasazi, early centuries of the Christian era, probably as an associate of pottery (Fig. 2, *a-e*).

Spindle whorls: mainly to Hohokam, by about 1200 (Fig. 2, *f-l*).

Stone elements:

Spool-shaped ear plugs: to Hohokam, by 1000 (Fig. 2, *m, n*).[26]

Nose plugs: to Hohokam, by 1000 (Fig. 2, *o-q*).

Mosaic discs (with iron pyrites overlay): to Hohokam before 700, and with psuedo-cloisonné decoration somewhat later.[27]

Chak Mool-like figure: to Hohokam, by 500 (Fig. 2, *r*).

Chipped crescents: to Hohokam, by 1000 (Fig. 2, *s, t*).

Mano with overhanging ends: to Hohokam (Desert Branch), by 1300[28] (Fig. 2, *u, v*).

Cross-shaped stones: to north Mexican and southern Arizona peoples by about 1000 (Fig. 2, *w, x*).

Shaped mortars: to Hohokam, by 800 (Fig. 2, *y, z*).

Figurine with vessel on head: to Hohokam, by about 1000 (Fig. 2, *aa-bb*).

Textile techniques:

Gauze weave: to Hohokam, by 1100, and via Hohokam to Anasazi.[29]

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24 Vaillant, S. B. and G. S., 1934, Fig. 27, *a, b* (Gualupita III), p. 121; Linné, 1934, pp. 184-186 (late period at Teotihuacan).

25. Cohabitation.

26 Ear plugs presumably of this type occur on figurines much earlier in the Hohokam Culture, but actual specimens do not appear until the Sedentary Period.

27 Gladwin, Haury, Sayles, and Gladwin, 1937, pp. 130-134; Morris, 1931, pp. 181-187.

28 Kelly, 1938, Fig. 27, *b* (Chametla); Ekholm, 1942, Fig. 20, *h* (Guasave); Scantling, 1940, Pl. 16, *a-c* (Jackrabbit Ruin).

29 Haury, 1934, pp. 95-98; also from Ventana Cave.

Weft-wrap openwork: to Hohokam and Anasazi, by 1100.[30]

Tie-dying (?): evidence so far is limited to Anasazi of 1200 or later.

The status of canal irrigation, cremation, throwing clubs, atlatls (spear-throwers), fur robes, and three-quarter grooved axes is debatable. The last named is early in the Hohokam Culture[31] and may have spread south as its distribution is pretty well limited to northern Mexico. Fur robes, throwing clubs, and the atlatl were widespread on an early plane and may have gone in either direction. Evidence for cremation is perhaps older in the Southwest than in Mexico and opportunities for the development of canal irrigation would appear to have been better in the arid Southwest than elsewhere.

If the parallels listed are accepted as having had southern origins, we arrive at the following elementary conclusions: (1) that the elements did not all move north at the same time, but began to spread as early as the dawn of the Christian era, continuing up into historic times; (2) that they did not all travel over the same route, some having reached the Southwestern frontiers over a northwesterly lowland course, while others appear to have moved through the highlands to the east; and (3) that all did not come from the same source.[32] Some are distinctly Middle American in flavor, others are matched most closely by traits in the Mexican highland cultures, and a few are from the northern fringes of the high cultures of Mexico.

This means that we should not look for a fixed route of entry, pointing back to a single culture group, or that we should endeavor to find traces of a band of people which emigrated wholesale from Mexico. The Mexican accretions were strongest in the Hohokam Culture between about A. D. 700 and 1100, which in itself suggests

30 In Central America a variation of this technique is seen in the textiles from the cenote at Chichen Itza (Peabody Museum collections). In the Hohokam layer of Ventana Cave, weft-wrap openwork was strongly represented; for occurrences among the Anasazi, see Haury, 1934, p. 95.

31 Gladwin, Haury, Sayles, and Gladwin, 1937, Plates 77, 78.

32 A similar situation has been deduced for northwestern Mexico (Kelly, 1943, p. 216).

infiltration by the normal processes of diffusion. Actual contact by southern traders undoubtedly existed but their influence was largely limited to the goods they carried.

The overall picture is one in which the Southwestern groups (particularly the Hohokam and Mogollon), with roots in pre-ceramic and pre-agricultural levels of culture, received the stimulus of higher attainments from the outside, and in this case from the south. This has become evident from the result of work in recent years with respect to the Cochise Culture and its probable connections with the Hohokam and Mogollon, and more particularly has this been brought out by the findings in Ventana Cave where the transition from a pre-agricultural and pre-ceramic status to agriculture and pottery was made without an apparent upheaval of people. This case shows logically that the Hohokam were descendants of the earlier food-gathering hunting folk.[33]

This brings us now to speculation as to the routes of entry and as to possible linked traits. Efforts to establish a corridor through Sonora and Sinaloa have been largely negative.[34] It has been suggested that such an avenue must lie farther to the east, towards or in the Sierra Madres. This may very well have been the case, but I believe there is some evidence to support the contention that an early wave of influence passed through the northwestern Mexican states. The best indication is botanical in nature. Beals shows[35] a continuous band of maize agriculture up the west coast (the most desolate section excepted) and extending into southern Arizona. In far western Arizona, agriculture was present, too, but not of primary importance. The type of corn grown through the lower Colorado River basin by the Yuman peoples and also by the Piman peoples north of the international line to the Gila Valley is a hot country corn, Anderson and Cutler's "Pima-Papago" race of *Zea Mays*, in contrast to the "Pueblo" race of the Plateau.[36] Significantly, Pima-Papago corn is the ancient type of the area, too, grown by the Hohokam and preserved in Ventana Cave.[37] Equally meaningful is the

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33 Report of Ventana Cave, in progress; see also Haury, 1943.

34 Kelly, 1938, p. 2; 1943, p. 216; Ekholm, 1942, pp. 135-136.

35 Beals, 1932, May 4, p. 159. 36 Anderson and Cutler, 1942, pp. 84-85.

37 The Ventana Cave specimens were examined by Dr. Anderson who pronounced them not different from modern Pima-Papago corn in all essential characters as ascertainable from cobs.

fact that Pima-Papago corn is quite similar to Basketmaker corn.[38] It looks as though both the Hohokam and the Basketmakers received a corn, probably by A. D. 1, suited to an arid environment on the initial northward diffusion of this all-important cereal, and that the Basketmakers were able to adapt it to a somewhat higher and cooler climate. Subsequent accretions, but not through the northwest Mexican or southern Arizona territories, lead to the development of the Pueblo race of corn. It is likely, too, that the Mogollon Culture, with southern frontiers in northeastern Sonora and northern Chihuahua, received corn at about the same time.[39]

With corn cultivation, or directly on the heels of its northward expansion, I believe we can postulate the arrival of pottery. This reached the Hohokam and Mogollon first[40] and the germ spread somewhat later to the Basketmaker who then went through most of the developmental stages under their own initiative. It is clear that early Mogollon and Hohokam pottery becomes more alike as one inspects older and older material. This refers to color, range of types, and design. The assumption of a common parentage for the pottery of these two groups is quite in line with the evidence. Further, what I consider of importance is the similarity of this earliest Southwestern ceramic fabric to the polished red, polished black, brown ware, and broad line red-painted types of the Middle Cultures of the Mexican highlands. The earliest manifestations of the Middle Cultures, believed to date before the time of Christ,[41] show a higher plane of development than do the oldest remains we now have for the Hohokam and the Mogollon. I see no probability that pottery will prove to be earlier than A. D. 1 in the Southwest.

A third element which may have been connected with this first period of expansion is the clay figurine. There is no use denying

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38 *Ibid.*, p. 84.

39 So far there is no good evidence of the kind of corn grown by them although the fact that they had corn at an early time (by the 4th century A. D.) seems fairly well established from the Arizona State Museum's findings in the Bluff site, Forestdale Valley (10 miles south of Showlow, Arizona).

40 This is strongly supported by recent work in the Bluff site, a village ascribable to the Mogollon people, with tree-ring dates in the early 300's (Douglass, 1942). In addition to meager amounts of indigenous pottery, there were a few Hohokam intrusive sherds but none of Basketmaker origin, although Basketmaker pottery occurs in later horizons of the local chronology.

41 Vaillant, 1941, pp. 26, 27.

that many unrelated peoples have made figurines and that similarities among them did occur. But here we are dealing with complexes in contiguous areas, as well as with some rather specific analogies, thereby reducing the possibility of coincidence. Figurines were known in the Hohokam from the time they had pottery.[42] We also have evidence now that the Mogollon Culture was acquainted with figurines by the 4th century.[43] A simple slab-type of figurine is also found in Basketmaker III,[44] possibly a far northern extension of the idea. The general similarity in style among these is shown in Figure 2, *a-e*. It needs to be pointed out, however, that the examples illustrated from Cuicuilco are not in the normal style for the site. They may well be survivals of a style from which the Southwestern forms were drawn, a style representative of an horizon of the Middle Cultures of Mexico which needs still to be determined.

The scheme just outlined—the recognition of a radiation of elements by about A. D. 1—agrees in the main with Ekholm,[45] who has worked at the problem from the southern or Mexican end. He also discerns a period of later contacts, a thesis with which I am in full agreement. This was after A. D. 500, with a probable peak of contact reached at about 1000. The Southwestern group affected was chiefly the Hohokam. The list already given demonstrates well enough the character and the approximate time of the elements involved.

There is no direct evidence to show over what route these travelled. Since resemblances occur in greater number among the River Hohokam, we may guess that the corridor lay well to the west in northwestern Mexico, either through Sinaloa and Sonora over routes similar to those followed by the early Spaniards, or somewhat farther to the east along the western foothills of the sierras. Here the river systems generally trend north and south, their heads leading directly to the upper drainages of the Santa Cruz and San Pedro Rivers, feeders of the Gila and the homeland of the Hohokam. Connections

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42 Gladwin, 1937, pp. 238-242. In Ventana Cave, where there was an opportunity to examine the transition from pre-pottery to pottery, no trace of the figurine complex in clay or in any other material was found in the pre-pottery debris.

43 Two have been found in the Bluff site, and while they are very simple, they are reminiscent of some Hohokam types.

44 Guernsey, 1931, pp. 86-87.

45 Ekholm, 1942, p. 134.

with Durango, the northern outpost of high cultures of Mexico would not appear too difficult to establish. It is worth noting that excavations in the states of Sonora and Sinaloa to date have all been in late horizons, too late to pick up many of the elements involved in this discussion, if the corridor was coastal.

That contacts were established between the Hohokam and northwestern Mexico in a late prehistoric time level can be shown. Excavations by the Arizona State Museum in Papagueria have focused attention on several elements which, beyond question, were immediately derived from Sinaloan sources. These are spindle whorls[46] (Fig. 2, *f, h*), the strange and highly characteristic mano with overhanging ends (Fig. 2, *u, v*), tortilla slabs[47] or griddles, and probably a short effigy pestle. In addition the marked resemblance in the red ware between Sinaloa and Papagueria has also been noted.[48] These elements all appear late in the Hohokam area, after 1200. The earlier connections with the south, possibly over a more easterly route, had ceased to exist by this time when the Hohokam Culture was ebbing.

Information is also accumulating to bring the Trincheras Culture into adjustment with the Hohokam sequence. This is worth mentioning here because we shall go much farther in the correlations if relationship is established between adjoining groups rather than by making large aerial jumps. Brand[49] has called attention to the fact that the international boundary marks the line of separation between the Trincheras and the southern limits of what we know as Hohokam. This coincides with our observations, too, and for a while it appeared as though there were little exchange between the two. Trincheras wares are now appearing with regularity in sites

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46 Very common in Classic Period sites in both River and Desert Hohokam (particularly in the latter). While these are often red-slipped and polished, they seldom carry a design beyond simple incising. There are specific shape analogies to the simpler types at Chametla and Guasave (Kelly, 1938, Fig. 24, *a-i;* Ekholm, 1942, Fig. 17, *a, q*).

47 I find no actual reference to these from northwestern Mexico nor is there clear-cut evidence for them in Papagueria. They occur in greatest abundance in the River Hohokam (Haury, 1945, pp. 109-111) and are dated to the Classic Period. A southern origin for this trait is, frankly, an assumption, based on certain premises which cannot be recounted here.

48 Ekholm, 1940, pp. 325-326; 1942, p. 77; Withers, 1941, p. 52.

49 Brand, 1935, p. 300.

north of the border[50] and the asssociation is with Colonial and Sedentary Period remains. Conversely, Hohokam elements have been recognized in the large and significant site at La Playa.[51] In fact, the similarity in the fundamental characters of the Trincheras Culture and that of the Desert Hohokam of Papagueria urgently calls for a revision of our concept of Hohokam, a need which Kroeber has already pointed out,[52] based on larger considerations.

In Chihuahua, the situation is somewhat better understood. On a probable Mogollon basis,[53] Chihuahua culture was later strongly influenced from the Southwest,[54] first from the Mimbres area and swayed still later by the southwardly expanding Salado. Southern Mexican ceramic derivations at this time appear to have been a form of black-on-red pottery according to Sayles,[55] and Ekholm[56] sees resemblances between the effigy vessels of Chihuahua and those of the Tarascan area.

It will be quite evident to the critical reader that the arguments presented herein and the nature of the data on which they are based fall short of being convincing. This is due basically to the inadequacy of the information which, so far, is in inverse proportion to the weight of the problem.

The parallels mentioned have been drawn chiefly from Central Mexico, involving a jump of over a thousand miles and an almost complete disregard of the intervening area. This omission is forced on us because the archaeological story of northwestern Mexico has not yet been written. When culture patterns and sequences have been determined for that vast region, the distribution of the traits which seem important in linking the Southwest and the high cul-

50 Withers, 1941, pp. 36-43; also in Ventana Cave and other sites of the Arizona State Museum survey. The Trincheras sherds reported from Snaketown in Pioneer Period context (Gladwin, Haury, Sayles, Gladwin, 1937, p. 218) may now be interpreted as a case of ficticious association.

51 The Boquillas site of Sauer and Brand, 1931, p. 93.

52 Kroeber, 1940, p. 480.

53 Gladwin, in Sayles, 1936, p. 94. The essence of the discussion here takes exception to Mr. Gladwin's statement, however, that the "earliest pottery-making culture of Chihuahua was derived from a source in southern New Mexico of Mogollon affiliation," and would refer this back to a southern Mexican source on the level of the Middle Cultures.

54 Kidder, 1916, p. 267.

55 Sayles, 1936, p. 85.

56 Ekholm, 1940, p. 329.

tures of Mexico may prove to be more continuous than is evident now, thereby strengthening the present thesis. They may, however, be lacking as the result of discontinuous diffusion. Further excavation alone can elucidate this aspect of the problem.

Beyond this necessity, something may be done towards setting the stage for a sounder approach to the problem by a reorientation of our thinking with respect to the southern limit of the Southwest as a culture area. This has never been satisfactorily set up, although, on the strength of ethnological data and, by inference, on archaeological evidence, too, Beals[57] has argued forcefully that this limit might be carried south to include the Cora and Huichol in Nayarit and Jalisco and that some such term as the "Greater Southwest" be used to encompass both the American and Mexican sectors. In Beals' words, "the problem of relations between northern Mexico and the Southwest" would then become "the problem of accounting for differentiation within the Greater Southwest." Obviously, this would not make the task of solving the problems easier, but with the Southwestern cultural frontier much nearer the high centers of development on the Mexican Plateau than it is at present, the forging of the final links would appear much less difficult.

Another step, calculated to consolidate existing archaeological evidence, would be the re-examination of acknowledged cultural frameworks in the Southwest, as the Hohokam and Mogollon, with the idea of relating to them cultural manifestations which at the moment are dangling. The incorporation of Trincheras with Hohokam has already been mentioned as desirable. Others, too, as the pattern south of the Sonora River and still another on the Mayo River,[58] might be brought into the Southwestern scheme with little added work. This would at least have the salutary effect of progressing from the known to the unknown, the only rational and safe approach to the problem of pre-Columbian Mexican-Southwestern contacts.

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THE CONTRARY BEHAVIOR PATTERN IN AMERICAN INDIAN CEREMONIALISM

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INTRODUCTION

DISTORTED or unnatural behavior is extensively exploited as a ritual device by the Indians of North America.[1] Available information points to the Southwest and the Plains as the two areas of richest development. In the former area the behavior distortion is epitomized in the ceremonial clown. In the Plains the emphasis is quite different. Anti-natural behavior is the point of focus as contrasted to the merely unnatural. The exact opposite of normal human behavior is the ideal sought. The ideal is reached in speech inversion but a compromise is necessary in behavior categories where true inversion is impossible. Humorous performances sometimes r 't; one trend led to the development of a near-typical clown. [illegible] clowning is not the objective; indeed, hardly more than incidental. In many instances the activities are profoundly serious. The terms of designation indicate the character of the cults; "contrary" or "crazy" are the most common descriptive terms. Accordingly, the phrase "contrary behavior" is here adopted to characterize the phenomena.[2]

In view of these facts it will be seen that the title of this paper limits present consideration to the Plains-type phenomena. The phenomena, however, are not limited to the Plains cultural or geographical area. Discovery of the Bluejay Character of the Plateau winter dance extended the distribution over a considerable portion of that inter-mountain area.[3] Great Basin parallels carry the survey

1 The historical present tense is used in the descriptive sections of this paper. Some of the rituals described are still performed in attenuated form but most are retained in memory only.

2 The term "crazy" has implications in English which are not present, e.g., in Algonkin; consequently the word is undesirable in a name. Neither "contrary dance" nor "contrary society" would be satisfactory since some are not dances, some not societies. "Anti-natural" or "'contra-natural" would be acceptable. Both are used occasionally in this paper to avoid repetition.

3 Ray, *The Bluejay Character.*

southward. And related rituals among the central Algonkin and Iroquoian peoples project the study eastward into the Woodlands.[4]

A mere recital of the elements common to the contrary behavior rituals of these areas would demonstrate the existence of extensive and significant cultural contacts. But my hope is to show to some extent the nature of those contacts; to distinguish the uni-directional from the reciprocal in cultural transfer; to ascertain whether organized systems of thought and behavior were transmitted, or elements only; and to follow the lines of growth, where the evidence permits. Thus one object of this study is historical: to contribute modestly to our knowledge of the growth of ceremonialism in North America with data which may also be used for illumination of larger historical matters, such as the cultural contacts, direct and indirect, between the Woodlands and the Plateau. A second objective is to determine the character of these psychologically significant rituals in which normal behavior is inverted: to distinguish the basic from the superficial, to analyze the factors in development, and to study the interactions of variants in contact.

The manifestations of contrary behavior are so numerous and varied that some kind of classification is a prerequisite to intelligible discussion. The system here employed is a compromise between an arbitrary expedient for temporary use and a logical classification emerging from analysis. Certain rituals exhibit unifying characteristics which are relatively easily ascertained. The most obvious linkage is that of a common name. Such a clue suggests structural unity among tribal variants, but is inadequate as proof. Rituals lacking the name may nevertheless belong in the category. Furthermore, certain connections are demonstrable despite variation in the traditional names.

We may first catalog those rituals which exhibit conceptual inte-

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4 Even so, the boundaries drawn for this study are somewhat arbitrary, especially the elimination of the Southwest and California. However, the latter areas, and all remaining areas of North America, have been studied with reference to clowning and related ritualism, by Julian H. Steward and the present author. This joint effort will be presented in the near future.

Steward began his studies of American Indian clowning many years ago; his paper, *The Ceremonial Buffoon*, appeared in 1930. He most generously placed at my disposal his notes on the Plains area, which have proved highly useful. I wish to acknowledge my indebtedness and express my deep appreciation for his kindness.

gration as opposed to merely formal unity. The criteria applied are three: source of membership or the basis of individual participation; the character and form of the ritual; and the individual and social function of the ritual. The varieties and distributions thus isolated are the following: the Bluejay Character, of the east central Plateau (native name); the Heyoka of the Dakota and the Ponca (Sioux name); and the Buffoons of the Plains Cree and Ojibwa and the Assiniboin (arbitrary name). These are described below at which time the individual criteria of classification are given. It will be seen that these cults are mere aggregations of individuals, not societies in the formal sense. Another common feature is that the criterion of membership is usually a supernatural experience.

In the second category the distinguishing traits are quite the opposite. Formal unity is characteristic, the specific formalism being that of the graded society. Conceptual integration is lacking. Supernatural sponsorship is also lacking. The most common naming pattern involves a "Dog" designation. Examples are found among the Mandan, Hidatsa, Blackfoot, Arapaho, and Atsina (Gros Ventre); that is, in all tribes with graded societies.

The third group is that in which fire ritualism is the dominant feature. The Hot Dances of the Hidatsa, Arikara, and Iowa are examples; also the Pawnee Iruska.

Brief descriptions of type examples and comparisons of variants are presented below. These are followed by analysis of the history of each as far as it can be traced without more than incidental involvement of other types. Finally, the interactions of the various types are discussed and over-all problems analyzed.

THE BLUEJAY CHARACTER

Description. The Bluejay Character is found as a ritual personage in the winter guardian spirit dances of the following southeastern Plateau tribes which occupy a compact area: Flathead, Coeur d'Alene, Spokane, Kalispel, Colville, and Sanpoil. The name is derived from the guardian spirit common to these ritualists and is the designation used by all.[5] Interpretation of the ritual is relatively uniform from tribe to tribe; all variants are recognized as belonging to the same pattern.

5 Sanpoil: qwa'skei; Coeur d'Alene: qwa'sqwel.

The criterion of participation is the possession of Bluejay as guardian spirit.[6] Dramatic epitomization of the mythological era is the function of the participants; some serve also as seers and pseudo-shamans and others act as sentries or sergeants-at-arms during the spirit dances. The ritual consists of assumed identification with the Bluejay character of mythological times and extreme demonstrations of this supernatural state.

The Spokane variant will serve as a type example. (I present a description in full since this is the first time it has been reported.[7]) At the time of the winter dances all persons with Bluejay "power" undergo a transformation which strips them completely of human characteristics; substituted are all the traits of the mythological being. Since the usual guise of the mythological character was similar to that of the human being today, complete identification is possible.

Clothing is discarded but a breech cloth of willow bark, from which hang twigs of fir, is worn. The face is painted black, also the hands, and the legs below the knees. During the two month period of the dances the Bluejay divides his time between performances at the dance lodges and wandering about the hills. Home contacts are completely severed; normal human associations abjured; and no food is eaten except pitch. The Bluejay's hair and ears are always full of pitch; likewise the spaces between his fingers and toes. At the dances he may be seen from time to time removing bits of this pitch and eating it. Usually he perches among the rafters at the dance lodge. He may dance with the others upon occasion but with unnatural and irregular steps. He is easily frightened; his defence is to clamber into the framework of the roof and hide. The dancers attract him to the floor again by making miniatures of various objects such as bows and arrows. These have an irresistible attraction for him; the dancers offer these objects as compensation for the services of the Bluejay in the recovery of lost objects. His clairvoyant powers toward this end are very great; it is especially easy for him to find objects which lie buried under the snow. Upon undertaking such a task he sights through a ring made of a twig. Then he leaves the

6 Or Owl, among the Sanpoil.

7 The original field data presented in this paper were obtained in the course of work sponsored by the Department of Anthropology of the University of Washington.

dance house but returns after only a moment's absence. The brief period suffices for even the most lengthy journey he is reputed to undertake. Upon his entry the recovered object is seen fastened to a small staff which he always carries.

The Bluejay may also be employed in a pseudo-shamanistic capacity. He is capable of removing from the stomach any foreign matter unintentionally swallowed. This ability is an analogue of the (bird) bluejay's grasping power. In his brief conversations with the dancers, in connection with events such as the above, the Bluejay always says the opposite of what is meant.

Sometimes the Bluejay is absent from the dance for several days at a time. Occasionally he is seen sleeping in the branches of a tree. Even though he falls from his perch to the frozen ground he is never injured. He will "fly" back to the limbs of the tree, jump from one tree to another, and finally settle down once more.

At the end of the dance period the Bluejays must be captured and returned to the human state, else they would remain in character permanently. They resist capture until physically overcome by the dancers, who sometimes pursue them for great distances. Then the pitch is carefully removed from their bodies, and the paint likewise. Retransformation is accomplished by smudging with sweet grass or throwing wetted ginseng root upon the body.

Among the Sanpoil, Colville, and Coeur d'Alene, the pseudo-shamanism is absent. The Kalispel and Flathead, however, emphasize curing procedures even more than the Spokane. The power for such cures is inherent in the Bluejay as a mythological being; as a human being he possesses no such talent.

Emphasis upon the Bluejay as a seer is strongest among the Coeur d'Alene. His ability to find lost articles is recognized also by the Colville, Kalispel, and Spokane.

The speech inversion of the Spokane is shared by the Colville and the Flathead. Among the latter it is little used; animal sounds and gibberish are more common forms of vocalization. The Sanpoil Bluejay foregoes all speech.

Food tabus are found in all examples. The Colville Bluejay eats pitch only; the Sanpoil, dirty or contaminated food; the Kalispel, "nothing at all"; the Coeur d'Alene and Flathead observe the food tabus common to all participants in the spirit dance.

Black body paint is used by all; the perch in the rafters is another common feature. Immunity to cold weather despite lack of clothing is a universal anti-natural trait.

The Sanpoil and Coeur d'Alene Bluejays serve as sentries at the midwinter guardian spirit dances and are charged with enforcement of the formal rules of the dance procedure. This is probably true for the Spokane also, at least in former times, and perhaps for all others.

Revivification or retransformation by smudging or shamanistic treatment is practiced by all tribes.[8]

In addition to the traits mentioned above for the Flathead—traits shared with others—certain additional features characteristic of that tribe must be enumerated. With reference to the Plateau alone these aspects are unique or markedly variant, but parallels will be found in other areas.

[On the evening of the fifth day of the Flathead spirit dance] the leader returns to the center pole and shouts, "Now we shall call the Bluejays." A series of four songs is sung; during the last one the dancers utter animal cries and stamp out the fires. A great deal of noise and whistling ensues. Within two or three minutes the leader orders the fires rebuilt. . . . Several dancers are seen to be absent. The leader addresses the audience . . . "Our Bluejays will soon be coming; don't laugh at them when they appear."

The Bluejay characters appear with faces, hands, and clothing blackened. . . . The characters carry miniature bows and arrows, crudely fabricated during the few moments of absence. They jump and run about erratically, climb onto the rafters of the lodge, and utter shrill, bird-like cries. . . . They sing a song of their own which conflicts in tempo with the dance song, and dance wildly about with no respect for order or time.

As the characters dance about they pick up small articles, such as feathers, strings, and twigs, that are found on the ground. These are secreted in the clothing. Later . . . a dancer approaches the character, saying, "Friend, let me care for your property." The Bluejay protests, but after repeated entreaties he gives up, one by one, the articles retrieved from the floor. As his "possessions" are diminished he circles about, faster and faster, shouting, "I'm rich; I'm rich," but meaning "I'm poor; I'm destitute." Finally, when nothing else is left, he gives up his bow and arrows. [Soon the Bluejay "dies"; he is revivified by smudging.] The black paint is washed off and he once more takes his place

8 Colville references above are taken from Cline, *Southern Okanagon*, pp. 152-153. All other data were collected by the present author. Except for the Spokane, fuller descriptions may be found in Ray, *The Bluejay Character*, and Ray, *Cultural Relations*, pp. 114-116; 121-122. See also Ray, *Culture Element Distributions*, pp. 251-252.

among the dancers. He becomes the center of attention as he tells of his "wanderings" while a Bluejay.[9]

History. The preceding descriptions show an impressive uniformity in ideology among all the variants. The Bluejay is always an adjunct of the great midwinter spirit ceremony; his character and actions epitomize the basic object of the dance, that is, contact with the supernatural world. The mythological identification is a nonvolitional process to which all persons with Bluejay as guardian spirit are subject. In this role social relationships are abjured and all behavior is contrary to the nature of man.

The Flathead interpretation conforms in all respects to these ideological principles. We must look to the formal aspects of the ceremony to account for the apparent distinctiveness. Among other tribes the Bluejay is a lone performer and he initiates his own ritual activities. There may be several of these characters at one dance but each acts independently. But among the Flathead the initiative comes from the audience, the normal dancers; and the Bluejays perform as a group. The sequence of activities conforms to a stable pattern. In no other tribe can the specific performances of the Bluejays be predicted prior to the dance. All the activities of the Flathead performer takes place in or near the dance lodge; the peregrinations of others carry them far afield. But the Flathead Bluejay nevertheless "tells of his wanderings" after he has been returned to normal. This suggests that the formal pattern of performance has been imposed upon or has grown out of a less rigid procedure, such as that of tribes characterized by actual wanderings.

The Flathead version not only differs in ritual character but also in numerous details, for example, the retrieval of small objects from the dance floor. There are no parallels for these traits in other ceremonies of the Plateau. But since the Flathead is the easternmost of Plateau tribes we may anticipate the appearance of analogues to the east. Also the ceremonial rigidity proves to be a reflection of the Plains pattern.

Among other Plateau tribes, ritual variables which appear to be of significance are the curing role, the use of reverse speech, and the clairvoyant powers.

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9 Ray, *Cultural Relations*, pp. 121-122.

The Bluejay is never a shaman. In the three tribes, Flathead, Kalispel, and Spokane, where he practices curing, his pseudo-shamanistic abilities are limited to the period of the dance, that is, the period of his identification with the mythological being. His techniques are restricted in like manner. Techniques and emphases differ in the three tribes; all have neighbors who do not delegate curing power to the Bluejay. Only local differences of interpretation seem to be involved.

Are any historical clues to be found in the distribution of the use of inverted speech and the emphasis placed thereon? The Colville, Spokane, and Flathead share this trait. The Flathead use it least although they are nearest the Plains where the practice is common. However, this lack of emphasis may merely be the result of greater play given to the use of animal sounds. Human speech is used but rarely. At the opposite extreme, geographically, are the Sanpoil whose Bluejay characters do not speak at all. This speech silence is thought to be in keeping with the ritual character. We may conclude that a choice must be made between simulation of the non-human mythological being by inversion of normal speech or by silence, gibberish, or animal cries. All tribes were acquainted with all techniques; each chose selectively.

The recovery of lost objects by means of clairvoyant powers (Colville, Coeur d'Alene, Kalispel) appears to be a borrowing from the widespread conjuring ritual which was shared by the Kutenai, Lakes, and Colville of the Plateau. Such recovery is often the primary object of the conjuring seance. Only the Colville share the two ceremonies; in their hands the typical conjuring talent was added to the Bluejay complex. The adjacent Spokane accepted this enrichment of the old ceremony; in turn it was borrowed by the Coeur d'Alene. The Kalispel adopted the innovation in limited and rationalized form. Only those articles consisting of animal organic matter can be found; for example, a fur robe, not a tule mat. The new trait did not reach the Flathead; it was rejected by the Sanpoil. Since it has been demonstrated that the conjuring ceremony reached the Plateau at a late date, it follows that the recovery talent is a recent addition to the Bluejay complex.[10]

10 See Ray, *Historic Backgrounds of the Conjuring Complex.*

The possibility that the Bluejay ritual itself is a recent innovation must be considered. The boundaries of the distribution are sharply defined. This might be explained on the east in terms of the basic Plateau-Plains boundary. But on the west the Southern Okanogan do not practice the ritual although they are a typical Plateau people. Nor do the Lakes, north of the Colville. These breaks could be understood if the ceremony had diffused westward at a recent time and hence failed to reach these outlying tribes. But there is no evidence within the Plateau of a westward diffusion. The easternmost tribe, the Flathead, exhibits the least typical ceremony. Furthermore, we know that both the Southern Okanogan and the Lakes are familiar with all the details of the Bluejay complex; in fact they often observe the ritual when visiting their neighbors, the Colville and Sanpoil, and are able to describe the ceremonies in detail.[11] They insist that the rituals are of immemorial age. They explain that they have not adopted the practices because they do not care for rituals of such extreme character.

Such evidence does not prove great age but does dispose of the suggestion of recent westward diffusion. Since there is no internal evidence of foreign origin we may ask whether a local point of origin is suggested. The answer is negative. It must be remembered that the area concerned is relatively small, the cultures homogeneous, and the people well acquainted with the practices of their neighbors. All share the mythological background which furnishes the ideological basis for the Bluejay concept.[12] Under such circumstances it is probably presumptuous to look for a locale of origin; it seems obvious that all tribes would have participated in the building of the complex. Our distributional analyses support this view.

It will be noted that the tribes of the Canadian Plateau did not accept the Bluejay ritual. This is one more example of the general subareal distinction between the northern and southern Plateau.[13] This may also account for the absence among the Southern Okanogan. Their connections with the Canadian Plateau are stronger than those of any other tribe of the southern area.

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11 Cf. Cline, *Southern Okanagon*, p. 152.

12. Cf. Ray, *Bluejay Character*, pp. 593-595.

13 Cf. Ray, *Cultural Relations*, pp. 147-148.

THE BUFFOON

Description. As indicated earlier, contrary behavior often results in humorous performances. We saw that the Flathead must caution their dance audiences not to laugh at the Bluejay. In the complex we are now to examine no such prohibition exists. Although the performers receive their powers through religious channels, and serve as shamans, their ludicrous anti-natural behavior is occasion for merriment. Through exploitation of this phase, the complex differs from all others in the contrary behavior sphere. A psychological affinity with the clown of the Southwest is apparent, but historical linkage is doubtful.

The Buffoon role is taken by the contra-natural characters of the Plains Ojibwa, Plains Cree, Assiniboin, Crow, Oglala, and possibly Blackfoot and Canadian Dakota—all northern Plains tribes. The first three use variants of the same term for designation; the Crow name is unrelated; the others are unknown.[14]

The criteria for this grouping are: participation by those experiencing a dream or vision of a specific supernatural being, usually "Skeleton" or "Cannibal"; the function is to provide amusement by performing in anti-natural and ludicrous manner; the ritual is a masked dance in which the performer is absurdly anti-natural both in costuming and in his actions.

As a type example we may select the Plains Ojibwa cult. Those who dream of the Skeleton Being gain the right (and perhaps the duty) of performing as buffoons. Their activities include masquerading in absurd costumes and the healing of the sick by exorcism. The costume consists of ragged shirt, leggings, and moccasins together with a cloth mask, sometimes conical, provided with an elongated nose and narrow eye slits. Crude staffs are carried, from which hang pieces of cloth, owl feathers, and deer dew hoofs. A bone whistle is used. Upon occasions the buffoon gathers followers, for whom he prepares costumes, and all live together in a special tent. During such times food is obtained by canvassing the camp for offerings which others hang outside their tipis.

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14 Plains Ojibwa: windigokan (Skinner, *Political Organization*, p. 500); Plains Cree: wetigokan (Skinner, *op. cit.*, p. 528), wihtikokan, "cannibal-like," (Mandelbaum, *The Plains Cree, p.* 274); Assiniboin: wi^{a}tgogax (Lowie, *The Assiniboine*, p. 62); Crow: akbi'arusacarica, "woman-impersonator" (Lowie, *Military Societies*, p. 207).

The offerings are stalked in ludicrous fashion. The clown crawls until at very close range, then crouches, draws his bow and shoots at the gift. If the arrow misses its mark the party moves on without claiming the food. However, the arrow may be retrieved and broken. But if it strikes the meat the performers rush frantically to the food, smell the point of the arrow and gesticulate wildly. Upon reaching their own lodge the food is thrown through the smoke hole, never carried through the door. No attempt is made to recover food which misses the smoke hole.

These buffoons are called to treat illness diagnosed as spirit intrusion. The whole troop participates; the treatment involves dancing, shaking of rattles, singing, and whistling. Their grotesque and fantastic actions are presumed to frighten away the offending spirits.

Throughout all of their activities these clowns use inverted speech.[15]

The Plains Cree buffoons correspond closely to those of the Ojibwa. Warfare is included in the activities of both groups. These ventures, which are of brief duration, are conducted on a pattern resembling the dance. Bison hunting is similarly pursued by the Cree. Formalized caricature includes dancing up to the enemy, and dancing fearfully around the fallen buffalo. The Cree leader drafts followers by surreptitiously entering a lodge and pointing his staff at any man present. Costumes include one which produces the effect of a great hump on the back.[16]

The Assiniboin buffoons are hardly to be distinguished from those of the two preceding tribes. Followers are drafted as among the Cree. Only one variation of critical significance appears: the Assiniboin clowns apparently lack curing functions of any kind.[17]

Among the Crow, details vary somewhat and organization differs. Supernatural sponsorship is apparently unnecessary. Curing practices are unknown. Ludicrous antics on horseback and absurd dances form the core of the procedures. Food is not stalked but bows of willow are used to shoot harmless arrows to "frighten" spectators. A clown masquerading as a pregnant woman plays an

15 Skinner, *Political Organization*, pp. 500-505.
16 Skinner, *op. cit.*, pp. 528-529; Mandelbaum, *The Plains Cree*, pp. 274-275.
17 Lowie, *The Assiniboine*, pp. 62-66.

important role, and sex play is emphasized. Reverse speech is not used.[18]

Scanty information from the Blackfoot indicates the presence of a clownish character who dresses in a long black robe and black paint, if not a mask. Like the Crow clown, he rides a horse but the nature of his performance is not known.[19]

The Oglala recognize a kind of cult known as the Dogs. Members possess spiritual power but act foolishly and perform to make observers laugh. They wear absurd clothing, peculiar ornaments, and body paint.[20]

The Canadian Dakota, formerly of the Wahpeton division, consider the clown to be the most powerful of shamans. He derives his ability from the guardian spirit "Clown" but is also associated with Thunder. His role is predestined before birth.[21]

History. Plains Ojibwa, Plains Cree, and Assiniboin variants exhibit an impressive degree of identity. All three conform to all criteria for this group but the Ojibwa and Cree versions are the more complex. They function more significantly in the total cultures since an important curing role is involved as well as clowning. Since the Assiniboin not only lack the curing function but also lack the Siouan name, using instead a corruption of the Algonkin term, we may assume that they borrowed the complex from their northern or eastern neighbors. The stalking of a slaughtered bison and the method of drafting followers are common to the Assiniboin and Cree but do not extend to the Ojibwa. This suggests that the Siouans borrowed directly from the Cree.

Although the Assiniboin lack the curing rule, participation does depend upon the possession of spiritual dream power. The specific interpretation of the Algonkins, Skeleton, or Cannibal power, gives way to the more Plains-like concept of Owl or Crow sponsorship. One step farther west, among the Crow, the supernatural feature is absent or at least unreported. To this extent the Crow practices fail to conform to the type criteria. Only if historical linkage can be demonstrated are we justified in including them. Similarities are

18 Lowie, *Military Societies*, pp. 207-211.
19 McClintock, *The Old North Trail*, pp. 291-292.
20 Wissler, *Societies and Ceremonial Organizations*, p. 99.
21 Wallis, *Sun Dance of the Canadian Dakota*, pp. 324-325.

numerous: ragged costumes including a cloth mask are worn; the leader enlists his followers; foolish and clumsy antics characterize the dancers; a circuit of the camp is made; bows and arrows are used in an unnatural manner to furnish amusement for the audience. The performance is a closer approach to pure clowning than that of any other Plains tribe. As such it is distinctly non-Plains like in character. None of the immediate Plains neighbors of the Crow share the practice.[22] Hence this clown ritual is either an innovation by the Crow or a remnant of the Algonkin buffoon complex. The latter alternative seems more probable in the light of the parallels and the distribution. The Crow adopted only the clowning phase of the foreign ritual; they received this, apparently, via the Assiniboin.[23]

The place of the Oglala in this picture is uncertain because of insufficient data. Apparently the quality of the ritual is about the equal of the Assiniboin, which might be anticipated if the ceremony were received directly from the Plains Ojibwa. We know that spiritual power is a prerequisite. The Oglala consider the ritual a very ancient one; without further evidence this belief is suggestive only.

In the fragmentary data on the Canadian Dakota appears the significant statement that the buffoon is a powerful shaman. This is a specific linkage with the Algonkin tribes.

THE HEYOKA

Description. All the Dakota divisions practice an anti-natural ritual known as the Heyoka. The adjacent Ponca also have a version of the ceremony which is known by the same name. In this complex the emphasis is placed upon the contrary behavior of the participants rather than upon the derived clowning. Indeed, the name itself means "anti-natural."[24]

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22 With the possible exception of the Blackfoot, whose clown-like performer is too meagerly described to justify comparative interpretations. See above.

23 Lowie is of the opinion that the Assiniboin, generally, were not to any extent originators or disseminators (*Plains Indian Age-Societies* p. 912). Perhaps that is why the ritual reached the Crow in abbreviated form. In any event the assumption of westward diffusion is strengthened. Cf. Lowie, *loc. cit.*

24 J. R. Walker states that "the term heyoka applies to any being who acts anti-natural." Mrs Eastman speaks of "haoka, the anti-natural god." (Both statements quoted by Wissler, *Societies and Ceremonial Associations,* p. 84.) Referring to the Dakota generally, Lowie writes that "everywhere the idea seems to be uppermost that the performers imitate some supernatural being or beings acting in a way contrary to

Those experiencing a supernatural vision involving Thunder or Lightning participate in the ritual; the performance of feats of supernatural and anti-natural character, together with buffoonery incidental thereto, is the function of the participants; the ritual focus is the withdrawing of pieces of meat from pots of boiling water with the bare hands.

Among the Eastern Dakota, participation follows an unsought dream of Thunder or Lightning, lest calamity befall the dreamer. The common dream experience is the only group tie; no society is recognized. The Heyoka ceremony includes much that is contrary to nature or custom but the most spectacular is that of plunging the arms into a container of boiling water and removing pieces of meat which have been cooked therein. At the same time the dancer splashes the hot water over his bare back, all the while complaining that it is cold. In preparation for these feats the arms are rubbed with a certain grass or covered with a root which is chewed and blown upon the skin. At other times the Heyoka parade through the camp performing in a clownish manner, or enter other dances and act in typical fashion. The costume exhibits numerous variations, including: near-nakedness, with strange body painting; ragged raiment together with a black cloth masking the face; tall conical hats; bark hats; simulated baldness with a bladder and white powder covering the head. Crooked sticks are used as bows; straw serves for arrows. Contrary speech is not used except among the Wahpeton.

The mythological associations of Heyoka are complex. Apparently four or more personifications are recognized: a two-faced man with a bow streaked with red lightning and a deer hoof rattle; a man with enormous ears and a yellow bow; a man with a flute; a whirlwind. These are sometimes visualized as giants, sometimes as dwarfs.

The Heyoka possess great supernatural power and it appears that their activities are essentially serious and are accepted as such.[25]

Oglala practices vary but slightly. The supernatural association with Thunder and the ability to withstand the heat of boiling water

nature and custom, so that possibly heyoka should be construed as a generic term covering all who indulge in such activity. . . . Backward speech was called *heyoka eyapi* . . . " (*Dance Associations*, pp. 113-114).

25 Lowie, *Dance Associations*, pp. 113-117; Dorsey, *Study of Siouan Cults*, pp. 468-471; Neill, *Dakota Land*, p. 268.

are similar. Mythological interpretation differs somewhat. Power is conveyed by a vision of the Winged God or any of several spirits which may come from that god. This god, whose symbol is a zig-zag red line, is endowed with an exceptional degree of supernatural power. Even so, the role of Heyoka is a dreaded one; the position brings little esteem but many inconveniences.[26]

An obscure sentence in an account given by an Oglala Heyoka may be of critical importance; "There are two kinds of heyoka, one kind is crazy or foolish."[27] This suggests that the clowning activities are appurtenances, not basic to the concept. The presence or absence of the trait is doubtless determined by the character of the dream. The variation in dress is apparently the consequence of differences in dream experiences also, since the individual patterns his costume on that of the supernatural donor.

The Ponca Heyoka are meagerly described but the pattern is familiar. The source of power is a dream, meat is removed from boiling water, the water is poured on the body and backward speech is used.[28]

History. Our information on the Heyoka offers no obvious clues with reference to local origins, except that there seems no reason to doubt that the Ponca borrowed the ceremony from the Dakota. The Ponca version is apparently the simpler and plays a lesser role in ceremonial structure than the Dakota counterpart. Skinner suggests that the Teton were the specific donors.[29]

The Ponca and Wahpeton use reverse speech; other groups do not. The latter fact may appear strange in view of the marked anti-natural character of the Heyoka. But other forms of vocal expression of a contrary character are present. Each Oglala ritualist has a special song but this is sung in company with others, resulting in a confusion of voices and consequent unintelligibility. Also, the Oglala performer is expected to make witty remarks when participating. This is hardly consistent with reversal of speech. We do not know the type of wit which is expected but may surmise that it is

26 Wissler, *Societies and Ceremonial Associations*, pp. 82-85; Dorsey, *loc. cit.*
27 Wissler, *op. cit.*, p. 83.
28 Skinner, *Ponca Societies*, p. 789.
29 *Ibid.*

specialized in character—akin perhaps to that found in the mythology—in keeping with the supernatural role of the performer.

In making comparisons and reconstructions it must be remembered that a wide range is permitted the Heyoka in actions and dress. The individual derives his pattern from his personal spiritual experience. These experiences all conform to the cultural criteria (Thunder symbolism; power and compulsion to perform unnatural acts, including the boiling water performance) but vary widely in details. This latitude is so definitely organic to the complex that any step toward greater formalization gives the impression of recency and superficiality. Thus even reverse speech, since it is a restrictive formalism, may be a late innovation. Likewise, the role of ceremonial clown is surely artificial and recent. Some reports of ceremonies make no mention of clowning, but rather present pictures of profoundly serious ritualism.[30] Even in the narrative of an Oglala informant who classes himself as a "crazy or foolish" type, the only mention of buffoonery is "joking with each other." Walker, on the other hand, states that the Heyoka "act the buffoon in all their helping, doing the opposite of what should be done, jesting, or doing anything which may be comical," and they are "expected to act the clown all the time"; further, "this feast is a hilarious occasion for all the people who attend it." But in the same account it is explained that if one experiences a Heyoka vision he must conform to the instructions or he will experience misfortune and perhaps even death. The Heyoka "is more or less shunned and is apt to become morose and melancholy and spend much of his time alone." He "may even be advised to kill a man, woman or child, in which case he must obey. . . . "[31] Recalling the statement that there are two types of Heyoka, one of which is foolish, we may conclude that the buffoonery is characteristic of the complex only when derived from the spirit experience and expressed individually. It is not a criterion of identity nor a part of the basic ritualism.

It is true that the boiling water and meat performance is itself a rigid formalization of contrary behavior; that here there is no latitude since all must perform this act. This is, indeed, the one

30 E. g., Mrs Eastman's account (quoted in Lowie, *Dance Associations*, pp. 115-116), and the various accounts, original and quoted, in Dorsey, *loc. cit.*

31 Wissler, *op. cit.*, pp. 83-85.

ritualistic device unifying the variants of the Heyoka. The trick is not exclusive to the Heyoka, as we shall see later. But only in the Heyoka is it found uniformly associated with the types of participation and function reviewed above. Wissler suggests that whatever group first made the meat withdrawing trick the core of the contrary behavior ritualism was, by virtue of that fact, the originator of the Heyoka. But evidence on this point is lacking if we limit ourselves to the present ceremony and its distribution. The two adequately known versions, Oglala and Eastern Dakota, are equivalents in this respect. Wissler introduces broader distributional data before reaching his conclusion, which is that the Eastern Dakota were the originators.[32] We shall return to this question later.

The Heyoka is certainly not a shamanistic or curing cult. But Pond refers to "inflicting and healing diseases, especially those resulting from the gratification of their libidinous passions."[33] Although ambiguous, this statement indicates that these pseudo-shamanistic powers are limited in scope. This is apparently an individual or local variant. The Canadian Dakota, however, class their Heyoka as powerful shamans. Furthermore, the spiritual power is derived from "Clown." These highly atypical features indicate marked revision of the concept at this outlying point, doubtless through influence of the Buffoon complex which flourishes in that area.

GRADED SOCIETIES

The contrary behavior rituals so far considered are not societies in the sense in which the term is commonly used with reference to Plains Indian ceremonialism. The fixed organization of the association type, with initiations, officers, membership structure and the like, is not found in any of the above. However, contrary behavior is present in the true societies, both the age graded and the ungraded. The graded type is present among the Mandan, Hidatsa, Arapaho, Atsina, and Blackfoot. All utilize anti-natural behavior as a ritual characteristic of one or another society grade.

Mandan. In this tribe the Crazy Dog society exhibits anti-natural behavior by treading on fire and removing meat from boiling

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32 Wissler, *General Discussion*, p. 861.

33 Quoted in Dorsey, *Siouan Cults*, p. 469.

water. In recent times the society has been fourth in the graded series; earlier it may have been first (lowest).[34] Maximilian states that the dance was purchased from the Arikara by the Hidatsa and shared by the Mandan.

> A large fire is kindled on the occasion, and a quantity of live coals is scattered on the ground, about which the young men dance, quite naked and barefooted. The hands, and the lower parts of the arms, and the feet and ankles, are painted red. A kettle, with meat cut in small pieces, is hung over the fire; and when the meat is done they plunge their hands into the boiling water, take out the meat, and eat it, at the risk of scalding themselves.[35]

Hidatsa. The description above was attributed by Maximilian to the Hidatsa as well as the Mandan. The informants of Maximilian and Lowie disagree as to whether the Hidatsa version falls in the graded or ungraded categories. The information furnished by Lowie's informant pertains to the independent society and will be presented later.[36]

The Hidatsa Crazy Dog society is wholly distinct from the above. Members exhibit no contrary behavior.[37]

The Real Dogs practice contrary behavior in some but not all phases of their ceremonies. Inverted speech is used and others are expected to address them in like manner. Inverted action is practiced as a derivative of the speech pattern. Thus if one inadvertently speaks in normal fashion to a Real Dog he will nevertheless do the opposite of what is requested. Another form of unnatural behavior is the ceremonial practice of embracing women at random regardless of closeness of kinship. The Real Dogs also perform the meat and boiling water ritual. At least one member is known to have traveled naked during the winter "to prove that he was a Real Dog." Sacred objects are shown no respect and proprieties are disregarded. The howling of dogs is imitated, especially before singing. The characteristic body paint is red.[38]

Arapaho. The third dance of the Arapaho graded series involves

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34 Maximilian's data place the society first in the series; Lowie's, fourth (Maximilian, *Travels*, vol. 23, p. 296; Lowie, *Societies of the Hidatsa*, pp. 306-309).

35 Maximilian, *loc. cit.*

36 Lowie, *op. cit.*, p. 252.

37 *Idem*, pp. 280-282.

38 *Idem*, pp. 284-290.

contrary actions of various types, but only during the latter half of a six day ceremony. The transformation to the anti-human state is attribute to the owl feather head bands of the dancers; when these are not worn actions are normal. The circlets have a small bit of root, probably the wild parsnip, attached. Likewise an arrow which is carried has this root fastened near the point. Paralysis may be inflicted by the touch of this arrow, it is believed; the affliction may be cured by rubbing the patient with the headband.

The elaborate ceremonialism includes shooting arrows at a bison chip and shouting and jumping toward it. A fire dance concludes the activities of the third day; the participants trample on the fire with bare feet until it is extinguished. During the three following days the dancers act in a most foolish and extravagant fashion; they are permitted to engage in all manner of mischief. Contrary actions and contrary speech are characteristic. Animal and bird antics are imitated. A dancer climbs a lodge pole and sits bird-like on top of the tent. Other dancers shoot at him, aiming their arrows backward over their shoulders, whereupon the performer falls down, rolls over, and lies as dead.

The dancers wear red robes and on the final day of the ceremony cover their bodies with soot. One performer of higher rank and distinctive dress is recognized. This is the "white fool," so named because his cape and body are painted white.[39]

Thunder symbolism is encountered in the Arapaho second dance, where it is associated with the fierce temperament of the dancer of the highest degree.[40]

Atsina. The Atsina contrary dance conforms closely to the Arapaho pattern, but ranks second in the graded series. The fire dance is similar. Dancers show contrary traits only during the second half of the ceremonial period but it is not certain that their owl feather headbands are the effective agents. Paralysis is caused and cured; the root is identified as wild parsnip. Arrows are shot in the air so that they will fall within the crowd; supposedly they hit no one. Ceremonial seizure of moccasins is practiced. Inverted speech is used.[41]

39 Kroeber, *The Arapaho*, pp. 188-196.
40 *Idem*, pp. 168-169.
41 Kroeber, *Ethnology of the Gros Ventre*, pp. 241-250.

Blackfoot. Anti-natural behavior plays a very slight role in Blackfoot ceremonies. The Piegan Mosquito imitates his namesake at one point in the dance by scratching others. In this activity instructions are interpreted in reverse but apparently the dancers do not themselves speak inversely. The Blood Mosquitoes, in addition, use tipi covers turned inside out in the construction of their transfer ceremony lodge.[42]

The Blackfoot Braves cast away moccasins, use inverted speech, and pretend to shoot arrows into the crowd, but the many other features of the ceremony lack contrary significance.[43]

Discussion. The Mandan and Hidatsa Crazy Dog societies are not only alike in name but are equated with respect to form and content by Lowie. Yet one, the Mandan, practices the boiling water and meat trick in typical form while in the other it is absent altogether. On the other hand, the Hidatsa do know and utilize the performance, in fact in two separate rituals. One is the graded Dog society where one or more officers, Real Dogs, are the actors; the other is the Hot Dance, which is probably ungraded. In the former the trick is a ritual incidental; in the latter it plays a central role.

The Mandan almost certainly borrowed the idea from the Hidatsa. Maximilian states that this is so and the Mandan distribution is restricted to one village. Furthermore, it seems reasonable to assume that if the Mandan Crazy Dog society had been the source of borrowing by the Hidatsa, the latter would have introduced the trick into their own Crazy Dog ritual, which lacks it.

The fact that the boiling water trick is geographically limited among the Mandan supports the above view and at the same time indicates a late reception. Likewise, the failure of the Mandan Crazy Dog innovation to react on the homologous Hidatsa ritual indicates a brief history.

The Arapaho and Atsina parallels are extensive, as is to be expected in view of the former unity of the tribes. Even so, the societies occupy different grade levels and differ considerably in ceremonial organization apart from the contrary behavior phase.

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42 Wissler, *Societies and Dance Associations*, pp. 376-377, 409; cf. p. 120.

43 *Idem*, pp. 377-382; McClintock, *The Old North Trail*, pp. 462-464.

which occupies only half the ceremonial period. During that half, however, the contrary concept dominates all behavior, numerous specific traits are identical, and ritual interpretations are similar.

The Blackfoot graded societies exhibit mere isolated fragments of contrary behavior. The Blackfoot Mosquito society is said to have been derived from the Sarsi society of the same name but contrary action is not mentioned for the latter.[44] The particular interpretation of Mosquito contrariness, reverse compliance with instructions, is found among the Hidatsa Real Dogs, from whence the suggestion may have come.

The only feature common to all expressions of contrary behavior among the graded societies is the type of organization involved. The particular societies differ and the ritual utilization of anti-natural devices varies. Only one pair of rituals can be said to be unified in both content and structure, the Arapaho and Atsina. In all other cases the diffusion of the societies has proceeded quite independently of the diffusion of the contrary concept. For example, it was demonstrated above that the meat trick of the Mandan Crazy Dogs was borrowed from the Hidatsa. But the society itself was originated by the Mandan and transmitted to the Hidatsa, as Lowie has shown.[45]

We may therefore discard the hypothesis that the graded society has served as a unit of diffusion of the contrary behavior pattern.

FIRE RITUALS

The Hot Dance. Among several tribes the ceremony which utilizes the meat and boiling water trick is known as the Hot Dance. Manipulation of other heated objects and handling of fire are also involved, but no other form of contrary behavior is practiced.

The Hot Dancers of the Hidatsa perform the hot water and meat trick after protecting their arms and hands with a plant substance which is mascerated by chewing and then applied. Dancers pretend to strike the kettle as they approach it. When the hot meat is withdrawn it is thrown upon a piece of hide prepared for the purpose. Sometimes a piece is placed on another member's back "by way of joking." A dance upon live coals is also performed. Other cere-

44 Goddard, *Dancing Societies*, p. 467.
45 Lowie, *Plains Indian Age-Societies*, pp. 942-944.

monial procedures include the lighting of pipes with hot embers carried in the mouth, and the presentation of the pipe to the four quarters when dancing and singing. Various kinds of body painting are used, including red lightning lines on legs, arms, and chest. The origin myth attributes the dance to Raven.[46]

In the dance of the Arikara the withdrawing of meat from the pot is conceived as analogous to meeting and defeating the enemy, albeit at the cost of injuries. The dancers approach the fire, retreat, then rush back and remove the meat. It is said that they are imitating animals. The medicine is applied after the burns are suffered. It is probably the same plant as that used by others since it is chewed before use. Hot water is splashed on one another by the dancers as they remove the meat, which is carried on the shoulders and given to the ceremonial "fathers."[47]

In the Iowa version the society members prepare for the ritual by sweating and singing. The songs refer to the supernatural donors of the fraternity's powers. The dancers then proceed from lodge to lodge, in each of which a pot of boiling meat awaits them. When withdrawn the meat is given to the spectators. No reference is made to the use of a protective herb. The nickname of the society, "coal grabbers," suggests that performances with fire are observed also.[48]

The meat withdrawing trick is mentioned in the origin myth of the Oglala Omaha or Grass dance.[49] It is also found in the Wabano of the Ojibwa. The significance of these occurrences will be discussed later. We must now examine the elaborate Pawnee society.

The Pawnee Iruska. This society is a powerful organization which "originally" consisted of leaders of the various animal medicine societies. Apparently no concern with fire was involved until a certain member, through lonely vigils, achieved an elaborate supernatural experience. The following excerpts from the story of his vision and subsequent activities present only the most pertinent data:

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46 Lowie, *Societies of the Hidatsa and Mandan*, pp. 252-253.
47 Lowie, *Societies of the Arikara*, pp. 668-669.
48 Skinner, *Societies of the Iowa*, pp. 702-703.
49 Wissler, *Societies and Ceremonial Associations*, p. 49.

The leader [of the supernatural beings which Crow-feather, the Pawnee, met in his vision] said to him, "Brother, you have been wandering over the hills for some time. We heard your cries and were sad and agreed to pity you and give you a new dance. You will call this dance iruska (fire inside of all things). . . .

A bucket of water rested on the fire. The men now began to sing while four of them rose and danced, holding corn husks in their right hands. They danced around the fire toward the bucket of water. They pretended to be attacking an enemy. Finally, they dipped the corn husks in the boiling water and swung them against Crow-feather, scalding him. When the people noticed that he paid no attention to his burns, they shouted, trying to frighten him that way. This too was of no avail. They seized him and held him over the fire. He screamed but they held him and rolled him in the hot coals. After a time he ceased his clamor for he no longer felt the pain. Finally they took him back to his place.

Another song was sung and all the men around the fire attacked it, now charging it and now retreating. During the third charge, Crow-feather noticed that the screaming and grunting was as of birds and animals. At the fourth charge, he saw that the dancers were imitating animals and birds. As they moved hastily toward the fire he saw each one drop something into it. They turned quickly: some flew away in the shape of eagles, turkeys, and crows, and others ran away as deer, wolves, and dogs.

[Later a stranger appeared to Crow-feather.] "Now I will show you the herbs and roots you must rub on your body when you dance; also the kind of wood you are to use in your fire. . . . Before the root is rubbed on the body, it should be put in a wooden bowl filled with water in which four live coals have been placed. Dip some of this up with a small buffalo horn spoon and put it in a wooden bowl and it is ready for use. If an enemy should attack your village do not mix the medicine in a bowl, chew some of the root, take it in your hands, and rub them on a kettle that is covered with soot and then rub the soot on your joints. You will have no fear of the enemy's fire. If anyone is burned by fire or scalded, chew some of the root and place it upon the affected part and the cure will be immediate. . . . "

Crow-feather went home. Several days later he determined to see whether the medicinemen understood the fire. He built a sweat lodge. . . . In the center he built a fireplace. He put the stones on the fire. When the stones were red hot he sent a messenger to invite eight medicinemen. . . .

"Brothers, I invited you into this sweat lodge for I have heard of your wonderful doings in the medicine lodge. I brought the timber which now stands over you; I gathered up your grandfathers who were seated upon mother earth and now they are ready to blow their hot breath upon us. The water is before us. We are seated in a dark place. Each one of you prepare yourselves, for no one must leave because of the heat. We are now imitating animals and birds. . . . "

The people began to hold medicine ceremonies during which sleight-of-hand tricks were performed. One night the crow imitators performed. They built a

fire and put a large stone on it. When it was red hot they put it on the ground and each man stood on the stone. . . .

[Several months later Crow-feather prepared his tipi for a great ceremony. All those who wished to be initiated came at the appointed time.] Then the candidates were received one by one. The first one who came was told to bathe in the preparation made ready by Crow-feather. When he was ready, he was taken to the fireplace and forcibly placed on the fire. . . .

[On the next day the ceremony was continued.] Crow-feather said, "Now we will begin our dance; the assistants may make a big fire, cut the dried meat and have the brass kettle ready." When everything was prepared he put a new knife in the bottom of the kettle, added water and then the meat. . . .

Finally Crow-feather danced up to the kettle which was full of boiling soup and took a piece of meat out with his bare hands. He gave it to one of the spectators who burned his hands with it. The rest of the members also did this. . . .

This was the first ceremony of this kind.[50]

HISTORICAL RELATIONS

The Iruska account to my mind provides conclusive evidence for the solution of several fundamental problems, which may be considered as the first step in a general discussion of larger historical relationships. Those relating to the anti-natural treading on fire and the meat and hot water trick may be considered here.

The meat withdrawing performance is shown to be a minor and nonessential feature of the Pawnee ceremony. It is not mentioned in that portion of the narrative which recounts the numerous manifestations of the fire handling power as exhibited by the supernatural beings. It is described in the historical sequel as an innovation of the Pawnee, Crow-feather. It is quite possible that the postscript was added, not several months later as in the recorded versions, but at an indefinitely later time determined by the actual invention or reception of the specific trait. I am assuming that the body of the narrative represents a roughly correct picture of the more ancient practices involving the handling of fire. This does not mean that the Pawnee invented these procedures. Fire handling of the types described is far more widespread than the whole of the contrary concept. But it is highly probable that the Pawnee were the most effective organizers of these practices in the area under survey and that the ritual complex was more or less widely distributed in the

50 Murie, *Pawnee Indian Societies*, pp. 608-616.

region before the particular trick with meat was invented; furthermore, that the elaborate and well integrated ceremony of the Pawnee exerted considerable influence in the area. Most of the regional fire dances which show a logical complex of features may be safely assumed to have been derived from the Pawnee. For example, the Arikara dance involves identification of the performance with meeting the enemy, mimicry of animals, and the application of the medicine as a curative agent. The Hidatsa carry hot embers in the mouth, pretend to strike the kettle, and dance on glowing embers. The Iowa ritual includes sweating, songs of the supernatural donors, and probably the handling of live coals. None of these exhibits any other type of contrary behavior; in fact the performance itself is not considered contrary in nature. There is no complaining that the water is cold, no reverse talk, and no buffoonery.

All of the tribes just mentioned practice the meat withdrawal trick but this fact has not been utilized in the analysis because of the suggested recency of the trait and the certainty that it has diffused, at least in part, independently of the Iruska complex. Its presence in the Hidatsa Real Dogs' ritual is an example. More impressive is the occurrence in the Wabano ceremonies of the Ojibwa and Cree. Skinner attributes the Wabano to the Menomini, Sauk, Potawatomi, Ottawa, Ojibwa, and Cree. According to the Menomini the name means "men of the dawn" or designates the god Morningstar. "Just at dawn he stands master of the day. He has an enormous mouth, and when the world is in danger he opens it and takes in the whole earth with all its inhabitants to guard it." Men who dream of this god become shamans of great clairvoyant powers. Among the Parry Island Ojibwa (Georgian Bay, Lake Huron), the wabano are specialists in plant medicines, the most talented and powerful of three classes of herbalists. The powers possessed are associated with "the twilight that precedes the dawn," but must be acquired by fasting, supernatural experiences, and apprenticeship to old doctors. The supernatural talents and botanical knowledge thus gained enable the wabano to cure the sick and to perform marvelous feats.

> At intervals it is customary [for the Menomini shamans] to give a public performance and exhibition of their power. At such times the wabano provides a feast of deer or bear meat for his guests, and, after the proper ceremony and songs, he chews up certain medicines and sprays them on his hands and arms.

He then has the ability to handle fire, or plunge his naked arms into boiling water or maple syrup. He will hold up one finger, and, as he dances in a circle it will appear to blaze. He is also said to be able to eat fire and to blow it from his mouth. Sometimes a wabano will spray his whole body with medicine and then apparently setting himself on fire, dance about blazing; yet he is never burnt. Often a wabano will hold a glowing brand in each hand, and never be scorched.[51]

It will be noted that there is no mention in Skinner's account of the specific meat withdrawing trick.

Likewise, in Hoffman's Menomini descriptions the wabano applies chewed root to the skin and handles fire but does not remove meat from the pot.

This feast is given at night; singing and dancing are boisterously indulged in, and the wabeno, to sustain his reputation, entertains his visitors with a further exhibition of his skill. Through the use of plants he is alleged to be enabled to take up and handle with impunity red-hot stones and burning brands, and without evincing the slightest discomfort it is said that he will bathe his hands in boiling water, or even in boiling sirup. On account of such performances, the general impression prevails among the Indians that the wabeno is a "dealer in fire," or a "fire handler." Such exhibitions always terminate at the approach of day.

The wabeno is believed to appear at times in the guise of various animals. . . .[52]

The Parry Island Ojibwa definitely include meat removal in their procedure.

At intervals in the dances one of the medicine-men might drum and dance alone around the fire, then, stooping, pick up from the embers a hot stone; or he might dip his fingers into a boiling cauldron, extract a piece of meat, and swallow it without evidence of pain. Some Indians say that he derives these powers from the medicines he rubbed on his hands. . . .[53]

These Algonkin observances constitute a distinctive fire ritual complex with significant historical implications. Before pursuing these implications, however, it is essential that we ascertain the specific role that the meat withdrawing trick has played in its various contexts.

Skinner implies that all the central Algonkins practice the trick.

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51 Skinner, *Associations and Ceremonies*, pp. 191-192.

52 Hoffman, *The Menomini Indians*, p. 151. Cf. Hoffman, *The Mide'wiwin*, pp. 156-157.

53. Jenness, *The Ojibwa Indians*, p. 63. Cf. Jones, *The Central Algonkin*, p. 145.

The Sauk,[54] the Parry Islanders far to the east of the Menomini, and the Dakota to the west, make use of the device. John Tanner mentions it for the Ojibwa.[55] We may conclude that the Menomini and other central Algonkins do know and occasionally use this particular trick. But for them it is not a distinct element of the fire ritualism. It is merely one of the variable interpretations of fire handling, a device which may be used at the option of the ritualist. He may handle hot rocks or hot coals; he may set fire to his finger or his body; he may plunge his arm into water or syrup—in the case of water he may remove meat if it be there, and if it occurs to him to do so. The significant fact is that this act is not a separately formalized element, to say nothing of being the core of the ritual.

In the Heyoka it is of course just that: the center of the ritual and, indeed, very nearly the whole of it. Now it is certain that all instances of the formalized meat withdrawing trick are historically connected. There can be no doubt of this because of the arbitrary character of the performance. It is reasonable to expect fire handling to be associated, occasionally and independently, with hot water performances. But nowhere in the Heyoka, for example, is the arm merely immersed in hot water, or the body bathed in hot water, or hot water swallowed; nor is hot roasted meat handled, or eaten or thrown at the spectators. Instead the ritual is simple, rigid, and arbitrary.

Only among the Pawnee and the central Algonkins do we find the variability, experimentation, and elaboration which suggest a point of origin. Furthermore, among both of these the protective plant substance is used in connection with the many types of fire handling, not just meat withdrawing. The Pawnee data indicate that this plant was used before the meat trick appeared. Indeed, it seems clear that these spectacular fire rituals could only have been developed with the aid of such a medicine.[56]

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54 Skinner, *Observations*, p. 55.

55 Tanner, *Narrative*, p. 135.

56 Grinnell identifies the plant used by the Cheyenne as *Dasiphora [Potentilla] fructicosa (The Cheyenne Indians*, vol. 2, p. 205). Some plants of this genus produce medicines which are powerful astringents and are used to allay pain. The plant is widespread over North America, hence this source provides no evidence of place of origin of Indian utilization. For the same reason the distribution of fire ritualism is not governed by the flora, as Wissler guessed *(General Discussion*, p. 872).

The evidence favors the claim of the central Algonkins over the Pawnee as originators. The Iruska is a reinterpretation of an earlier animal society, hence at least relatively late; whereas the fire rituals of the Algonkins are deeply rooted in the regional shamanistic complex. The latter involves animal identifications as well. Knowledge of the plant medicine is an isolated bit of esoteric lore to the Pawnee ritualist. But the wabano is a doctor who not only prescribes medicines but experiments with them. Surely he is the more likely inventor of the two. Indirect evidence of the relative recency of the Pawnee ritual is the fact that the Mandan, who doubtless received their fire dance via the Pawnee, did not get the performance until Maximilian's time. Yet in the early 1800's Tanner found the Ojibwa use of the trick traditional. Wissler believes that the Pawnee borrowed from the Dakota, rather than the reverse. In turn the Dakota could only have received the meat trick from the Algonkin, perhaps directly from the Ojibwa.

Apparently this was not the first diffusion of fire ritualism from the central Algonkin source. The larger picture may be conceived as follows. At the earliest level the Pawnee and central Algonkins, together with many other American tribes, shared shamanistic organizations which involved animal identifications. Each organization became elaborated in its own way. The Algonkin shaman, an herbalist, discovered a plant substance which permitted impressive amplification of fire ritualism. The knowledge and practice spread to the Pawnee, probably via the Iowa. At this time the three groups were in closer contact; the westward expansion into the true Plains had not yet occurred. The Arapaho, and possibly others who later moved westward, obtained their fire dances at this time.[57]

Somewhat later the Arikara broke away from the Pawnee. Their present fire ritual exhibits the old Pawnee method of applying the medicine after the burn. The Arapaho migrated to the western Plains and the Dakota began their expansion. There followed a period of great ceremonial elaboration. The Dakota seized upon a spectacular unit of the Wabano ceremony, the meat withdrawal, together with the protective medicine, and made it the ritual core of

57 For the history of migrations and tribal movements in the area see: Strong, *The Plains Culture;* Kroeber, *Cultural and Natural Areas,* pp. 76-91; Wissler, *Population Changes,* pp. 18-19.

a cult which doubtless already existed. The members of this cult were individuals who feared or revered thunder and lightning because of dreams or visions of supernatural character in which these phenomena were symbolic. The further association of this cult with grotesque mythological beings or semi-deities, giants, and dwarfs is indicative of complex cultural depth. Anatomical distortion is seen in both Heyoka (e. g., large flapping ears) and Wabano (Morning-star's enormous mouth). Heyoka dress is another example of grotesquesness and variation. These beings are not only supernatural but anti-natural. The only ritualistic character possessed by the cult prior to the introduction of the meat trick was apparently a mild sort of anti-naturalism. The Heyoka flourished with the expansion of the Dakota and the stimulus of the spectacular trick. The contrary pattern grew apace, but never became highly formalized; it continued to be a serious affair. Formalism came, however, at the hands of the Hidatsa who borrowed the skeleton of the Heyoka as the distinctive ritualism of the officers of one of their graded societies, the Dogs.

The Pawnee accepted the formalized meat trick as an adjunct to the Iruska and added an explanatory passage to the myth of origin of the society. In time the impact of the contrary behavior pattern of the Heyoka led the Pawnee to develop a new society, the Children of the Iruska, which reflects the spirit of the Heyoka. The anti-natural complex was too foreign in character to be amalgamated with the Iruska itself. This fraternity was apparently quite a late innovation. It borrowed from other contemporary societies as well as the Heyoka. Its role is a minor one; its members are few.[58]

The Arikara were likewise influenced by the growing emphasis upon specifically anti-natural behavior. The result is their "Foolish People" cult; again the membership is small. The contrary behavior is associated with an apparently intoxicating beverage which is drunk at initiation. The concern with strange snakes is a linkage with the Pawnee.[59]

Meanwhile the meat withdrawing trick had diffused to the Arikara, Hidatsa, and Mandan. The specific sequence of events is uncertain. The Arikara added the trick to their fire dance but

58 Murie, *Pawnee Indian Societies*, pp. 580-581.
59 Lowie, *Societies of the Arikara*, pp. 673-675.

whether they got it from the Pawnee or directly from the Dakota is not clear. The Hidatsa Hot Dance must have come from the Arikara but we saw above that the use of the trick by the Hidatsa Real Dogs was in all probability adopted directly from the Heyoka of the Dakota. The Mandan dance and trick, of the Crazy Dog society, was taken from the Hidatsa Hot dance very recently.

The Cheyenne reached their western home at about the same time. During their migrations they had been in fairly prolonged contact with the Assiniboin, whose Buffoon was well developed, and with the Dakota, and their Heyoka cult. Later they became the neighbors of the Pawnee and the Arapaho. Receptive and energetic as they were, it is little wonder that they developed the most elaborate interpretations of the contrary behavior concept of any tribe. Even so, the basic patterns as indicated above are visible and indebtedness consequently ascertainable. The descriptions of their two ceremonies have been reserved for presentation here where they may be most meaningful.

[Members of the Cheyenne Contrary Society]—people who greatly fear lightning and thunder, most of them old men and old women—take part in a ceremony which is held at irregular and infrequent intervals. In this society by their actions and words members attempt to reverse things, to do the opposite of what they are supposed to do; they back into and out of the lodge; and sit on the ground upside down, that is to say, with head and body on the ground and legs in the air. They are fun-makers, and their absurd actions are enjoyed and applauded by the people.

It is believed that the Contraries can do much for the sick. If one of them touches a sick person, or jumps over him, it is a great help to him. Sometimes on the occasion of these ceremonies they lift up the sick and then put them down, or sometimes lift them up and hold them head downward. . . .

When the time for the ceremony has been determined on, some old woman, who has taken part on a previous occasion, is sent to call those who have pledged themselves. She backs into the lodge where one of these resides, and says, "I have not come for you." The person addressed knows that the ceremony is about to be performed and that he must attend. When the one who is to make this sacrifice takes the pipe to the priest in charge of the ceremony and asks for instruction, the pipe is reversed; that is, the stem is fixed in the bowl of the pipe and the hole which commonly receives the stem is filled with the smoking material.[60]

The ritual revolves about the meat withdrawing trick, which is

60 Grinnell, *The Cheyenne Indians*, vol. 2, pp. 204-206.

performed in typical manner. Attendant dancing and other activities are all of an eccentric character intended to amuse the spectators. Some of the performers wear scanty costumes of rags.[61]

In addition the Cheyenne have a cult called by the same name, "Contraries," which is a small aggregation of individuals—not a society—likewise fearful of thunder and characterized by contrary behavior of a highly serious nature. Such a person is not permitted to associate equally and familiarly with others in his camp, nor is he allowed to join in any of the gay activities around him. Indeed, even marriage is prohibited. Reckless abandon must be shown in warfare.[62]

The Cheyenne elaboration is the consequence of possession of all three contrary behavior themes, each of which they intensified or reinterpreted. The Buffoon is seen in the costume, the absurd actions, and the specialized curing techniques of the Contrary society. Even the meat trick is made a humorous performance. In the Heyoka such levity is unthinkable. But the trick and the thunder symbolism were surely taken from the Dakota ceremony.

The cult, the Contraries, is reminiscent of the Children of the Iruska, in the small membership, the prohibition of marriage, the sober and lonesome life, and recklessness in warfare. We may assume that it developed only after the Cheyenne came in contact with the Pawnee.

Contra-naturalism is carried very near its logical conclusion by the Cheyenne. They apply the principle to all aspects of behavior within reasonable physical limitations; others select certain activities only for ritualization in anti-natural terms. The Cheyenne were essentially borrowers in the larger view, but the intensity of their pattern exerted considerable influence on their neighbors. The consummation of the contrary behavior pattern is to be credited to them.

Certain antecedents of the Buffoon complex remain to be examined. We found that the pattern diffused westward from the region of the Plains Ojibwa. But the latter moved to the Plains from a former Woodland home and we may look to that area for possible

61 *Idem*, pp. 204-210, 329.

62 *Idem*, pp. 79-86. Cf. Dorsey, *The Cheyenne*, pp. 24-26; Mooney, *The Cheyenne Indians*, p. 413.

connections. Indeed, Skinner long ago pointed out striking parallels with the Iroquoian False Face society.[63] These include dreams of the supernatural as a prerequisite for participation, the exorcism of disease spirits, the appropriation of food, the ragged costume, the carrying of staffs, and the wearing of masks. Skinner notes, however, that the masks of the Iroquois are carved of wood, that the dancers do not employ special lodges, do not use inverted speech, and do not go to war.

Other data substantiate all of the parallels and remove some of the exceptions. The Iroquois do in fact use skin or cloth masks identical to those of the Plains Buffoons, and these are shared by the Algonkin adjacent to them. Furthermore, the association of the Plains Buffoon concept with cannibal clown is found here. Fenton explains: "The Iroquois and their Algonquin neighbors use buckskin masks to impersonate cannibal clowns who sometimes kidnap naughty children. The Seneca call this clown 'Longnose' because of his elongated proboscis." The Seneca long nosed cannibal clown frightens children; the Plains long nosed cannibal clown frightens disease spirits.[64]

Masks of the type described probably antedate the wooden masks of the Iroquois. Fenton suggests 1648 as the date of introduction of the latter. But a highly significant statement relating to the Huron, who live between the Iroquois and the Ojibwa, states that in the Midwinter Festival of 1636 "You would have seen some with a sack on the head, pierced only for the eyes; others were stuffed with straw around the middle, to imitate a pregnant woman." Here we have not only the typical mask but also the familiar type of simulated body deformation. And the following year, 1637, ". . . they donned their masks and danced, to drive away disease."[65]

Inverted speech is, indeed, not typical of the Iroquois dancer. Instead he uses grunts and gibberish. This is reminiscent of the

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63 *Political Organization*, p. 504. Cf. Smith, *Witchcraft and Demonism*, pp. 187-193; Parker, *Secret Medicine Societies*, pp. 182-184; Fenton, *Masked Medicine Societies*, pp. 415-418.

64 Quotation from Fenton, *op. cit.*, p. 418. For an Ojibwa mythological explanation of the origin of the cannibal trait see Coleman, *Religion of the Ojibwa*, pp. 40-41.

65 The statements, by Brebeuf, are quoted in Fenton, *op. cit.*, p. 414. Simulated anatomical deformation is found not only among the Plains Cree and Crow but also among the Paiute, as indicated below.

Bluejay Character; the same interpretation holds.[66] The backward speech was added under Plains influence. Likewise the use of a special lodge is an aspect of the Plains pattern. The same may be said of linked warring activities. Bravery in warfare is too generally emphasized throughout the Plains to be of diagnostic value in the present case or in any of the other analyses here presented.

Thus Skinner's conjecture proves thoroughly sound. The specific events linking the eastern antecedents and the Plains Buffoon complex are not yet known but the relationship cannot be doubted. As a working hypothesis we may assume that the Huron transmitted the basis of the clownish rituals to the Iroquois in the one direction and the Algonkin and Ojibwa tribes in the other; and that those Ojibwa who moved westward carried the practices to the Plains.[67]

The westernmost tribe included in the survey above of the Buffoon complex is the Crow. One step further west are the Shoshoneans. The Bannock are adjacent to the Crow; the Northern Shoshoni and Northern Paiute are not far distant. Associated with the socio-religious Circle dance of these groups are clowns which resemble those of the Crow. Costumes, masks, painting, and antics are similar. Park describes the Northern Paiute (Paviotso) performances under the name "Hump dance." The name is derived from the method of costuming by which a great hump on the back is simulated, exactly as by the Plains Cree Buffoons. Also, the effect of lumps is produced on the legs and belly, and men masquerade as women. Masks of the skins of animal heads are worn or the face is made grotesque with paint. The clowns dance during intermissions in the Circle dance. Apparently the whole object is to provide amusement for the spectators. Discordant dancing is performed; cripples, old people, and women are mimicked.[68]

Further parallels with the Plains Buffoon, found among other groups, are the use of cloth sacks for masks and the painting of the face with mud. The Basin distribution is limited but the distribu-

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66 See above.

67 Fenton's data suggest that the Huron contributed the mask complex to the Iroquois (*op. cit.*, pp. 415-416). Parker credits the Huron with introduction of masked shamanism to the Iroquois (*Secret Medicine Societies*, pp. 172-173).

68 Park, *Culture Succession*, pp. 188-190; Park's data refer generally to the Northern Paiute (Paviotso).

tion extends from the Bannock to California. At the latter point an area with another clowning complex is encountered.[69]

Thus the Basin practices may have come from either of the two areas. It may be stated categorically that similarities with the California complex are vague and scanty, whereas we have found those of the Plains to be highly specific. Furthermore, California clowning is apparently an old institution while Basin practices appear to have been introduced but recently. Steward's Snake River informants and some of Park's informants characterized clowning as a late innovation, perhaps not older than 1850 or even 1900. Park states that "In the pattern of exhibition dances the masked clownish performances of the Paviotso are unique and differ fundamentally from other Basin dances." These facts, together with the limited distribution, definitely place Basin clowning late in time. This is consistent with a Plains origin since the Buffoon complex did not reach the Crow until late. Since the conclusions as to source and age are based upon independent evidence of compelling character we may conclude that the source of the Basin clown was the Plains Buffoon.[70]

Thus we have shown an historical linkage of the Iroquoian masked dancer, the Plains Buffoon, and the Basin clown; a continuous line of diffusion from the Great Lakes to western Nevada; and a minimum time span of three hundred years.

ELEMENT DIFFUSION

From time to time in the foregoing discussions it has been necessary to utilize individual elements in making comparisons and inter-

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69 Steward, *Culture Element Distributions: XIII*, pp. 265, 324; Steward, *Culture Element Distributions: XXIII*, pp. 287-288, 349; Stewart, *Culture Element Distributions: XIV*, pp. 416-417; Curtis, *North American Indian*, p. 85. Cf. Steward, *Ethnography of the Owens Valley Paiute*, p. 320. The total distribution, as indicated by Steward and Stewart, follows: Northern Paiute of Snake River, Mill City, and middle Humbolt River near Winnemucca, Pyramid Lake, Carson Sink, Humbolt Sink, lower Walker Lake, and the Quinn River drainage near McDermitt, Nevada; the Lemhi and Fort Hall Shoshoni, and the Bannock. Clowning was denied by all Stewart's Southern Paiute and Ute informants (*Culture Element Distributions: XVIII*, p. 333), and all informants of eleven Northern Paiute bands.

70 Steward, *Culture Element Distributions: XIII*, p. 265; Park, *op. cit.*, p. 190; quoted statement, *idem*, p. 196.

Park discusses possible origins of Basin clowning at some length, weighing Southwestern, Californian, and Northwest Coast parallels, but finds none that are satisfying. He does not consider a possible Plains origin.

pretations. However the preferred method has been to trace concepts and logical complexes. One reason for this is found in the statement of objectives: to determine the structural and functional character of these rituals. The other reason involves historical methodology and the special bias of Plains culture where ideological tolerance permits almost any permutation of elements from the ritualistic stock in trade. The richness of detail in most of the Plains manifestations of the contrary concept is a reflection of general ceremonial wealth and the free exchange of elements from ceremony to ceremony, rather than elaboration of the concept itself.

This was found to be true even with respect to inverted speech. Furthermore this trait is found in a number of Plains ceremonies quite unrelated to those here reviewed. It is probable that formal speech inversion is an older practice than contrary behavior. It certainly is not diagnostic of the latter; its use may involve mere irony. Wherever anti-naturalism is consciously sought the use of inverted speech is a reasonable practice and may be anticipated, especially if it be known already to the culture. However, if the contrary concept be the outgrowth of animal mimicry, for example, we need not be surprised at the absence of the trait. Reverse speech frequently has been confused with reverse reaction to instructions. While the two may be related they are nevertheless distinct practices.

Isolated elements may be used for historically valid interpretations only if they are culturally and environmentally arbitrary. The mere carrying of bows and arrows in a ceremony is of no interpretive value if these are customary weapons. But if the bow has a lance point on one end, this arbitrary and functionally useless object is an indication of diffusion wherever found. The same is true of crooked and useless bows and arrows which many contrary dancers carry. Again, the simple begging of food by the cults of two tribes does not prove that one borrowed the practice from the other, but when the food in both instances is thrown through the smoke hole of the lodge there can be no doubt of unity. Animal mimicry is an enlightening example. Culturally basic rather than arbitrary, it cannot be of historical use unless phrased more specifically. An historically useful variant of specific form is the perching of a dancer in the roof timbers of the dance lodge, as among Plateau tribes and the Arapaho. Costume details are generally indecisive if the basic garment pattern

be the same. Also, costumes are apt to be shared by a number of societies, with but minor and variable differences. However, such arbitrary elements as the conical hat, the sack type mask, and the humped back, are clearly indications of diffusion when distributed contiguously.

The significance of environmental considerations is illustrated by the use of body paint. In some areas red is unavailable, but black is always available in the form of soot. Emphasis upon black in parts of the Plateau is thus explained. When both the Arapaho and Pawnee, for example, rub their hands on sooty kettles and transfer the carbon to the face, it may suggest borrowing, but it must be remembered that this is a logical and simple way to obtain and apply black paint.

More important, with respect to paint, is the limitation of colors. If in one area only black, red, and white paints are available, then all tribes and all societies of each must use one or a combination of these. Thus the emphasis by the graded societies on red paint, of the Bluejay and Iruska on black, and so forth, is of little significance. Another example of limited possibilities is the variation in the Plains in the wearing of a fur robe. It may be worn with the hair inside, or outside. Either practice considered alone, even though customary, means nothing,

The arbitrary trait is epitomized in the practice of ritual retrieval of small objects inadvertently dropped on the dance floor. Found among the Flathead, Kansa, Winnebago, and others, it strongly points to a common source.

Originally it was my intention to enumerate the linkages indicated by the distributions of these arbitrary elements. However, with the task completed, it is apparent that no new information is conveyed and a great deal of space would be required for presentation. We already know that extensive tribal interchange of ritual traits occurred in the Plains and on its borders during the recent period of intensive ceremonial growth. Lowie, Kroeber, Spier, and Wissler proved this long ago. Such an enumeration would throw no new light upon the contrary concept. In the accounts above the most useful details are presented and the general extent of overlap can be judged.

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THE PATAYAN PROBLEM IN THE COLORADO RIVER VALLEY

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UPON comparing the archaeology of the valley of the Colorado River, between Lake Meade and the Gulf of California, to the rest of the Southwest, we are impressed with how little is known. When the first white men arrived, we know that a large population speaking various Yuman languages occupied the area,[1] and archaeological surveys by Gila Pueblo, San Diego Museum, Southwest Museum, and the Museum of Northern Arizona indicate that American Indians have lived in the valley from very early times.[2]

Before the introduction of pottery making, the Colorado Valley was occupied by a population whose only evidence is marked by lithic industries. These cultures have been fully discussed by Rogers[3] and are not included in the present paper, the scope of which is limited to those cultures with ceramic remains.

The ceramic remains of the Colorado Valley, especially the uplands to the east, consist largely of sherds of pottery types that have characteristics sufficient to show that they are different from others in the Southwest. This pottery is usually buff, brown, greyish brown, or reddish and shaped by the technique known as paddle and anvil. Many of the sherds show a glazed or fused surface which Rogers has

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1 Herbert E. Bolton, *Father Escobar's Relation of the Oñate Expedition to California* (Catholic Historical Review, no. 1, p. 1941, 1919); *idem., Rim of Christendom* (New York, 1936); Elliot Coues, *On the Trail of a Spanish Pioneer: the Diary and Itinerary of Francisco Garcés, etc.* (2 vols., New York, 1900).

2 Malcolm Rogers, *Aboriginal Culture Relations between Southern California and the Southwest* (Bulletin, San Diego Museum, vol. 5, no. 3, 1941); Harold S. Gladwin, *Western Range of the Red-on-buff Culture* (Medallion Papers, no. 5, Gila Pueblo, Globe, Arizona, 1930); *idem, A Method for the Designation of Cultures and their Variations* (Medallion Papers, no. 15, Gila Pueblo, Globe, Arizona, 1934); Harold S. Colton, *An Archaeological Survey of Northwestern Arizona* (Bulletin, Museum of Northern Arizona, no. 16, 1939).

3 Malcolm Rogers, *Early Lithic Industries of the Lower Basin of the Colorado River and the Adjacent Desert Areas* (San Diego Museum Papers, no. 3, 1939).

called "skum."[4] The pottery manufactured in the flood plains of the Colorado seems to have been made from alluvial clays and is lighter colored than pottery from the nearby desert mountains where residual clays from volcanic or crystaline rocks have supplied most of the material. In these wares paint was rarely applied as a decoration to any of the surfaces, although some decorated sherds with crude designs in red or black have been described.

Attempts to date the pottery of northwestern Arizona must be undertaken with caution. As a basis for dating, we have correlations with pottery types from the Plateau area, types that have been dated by tree ring methods. On six sites where Cerbat Brown, one of the common types, was dominant, a few sherds of the following Plateau types were found: Lino Black-on-gray, Kana-a Black-on-white, Deadmans Black-on-red, and Tusayan Black-on-red.

Sandy Brown is another common pottery type of northwestern Arizona. On sites with this type have been found sherds of Kana-a Black-on-white, Black Mesa Black-on-white, Dogoszhi Black-on-white, Deadmans Black-on-red, and Tusayan Black-on-red. A third common type is Aquarius Brown and on sites where this type is dominant sherds of Kana-a Black-on-white have been gathered.

Tree ring studies have shown that Lino Black-on-gray was manufactured on the Plateau between 500 and 700 A. D., Kana-a Black-on-white between 700 and 900 A. D., Black Mesa Black-on-white between 900 and 1100 A. D., Dogoszhi Black-on-white between 1075 and 1150 A. D., Deadmans Black-on-red between 950 and 1050 A. D., and Tusayan Black-on-red between 1050 and 1125 A. D. It is clear that the sites in northwestern Arizona were occupied before 1100 A. D. and were contemporary with stages Basket Maker III, Pueblo I and II of the Anasazi series.

From the Mojave Sink area in California, west of the Colorado River, Rogers has published illustrations of Pueblo sherds.[5] Those that can be determined by inspection of his illustration are all pre-1100 A. D. There is no evidence that the sites back from the river

4 Malcolm Rogers, *A Question of Skumming* (Arizona Old and New, vol. 1, no. 2, p. 5, Phoenix, 1928). A firing skum is well known to ceramitists and is due to soluble and easily fusible salts reaching the surface during drying.

5 Malcolm Rogers, *Report on an Archaeological Reconnaissance of the Mojave Sink Region* (San Diego Museum, Archaeology, vol. 1, no. 1, February, 1929), p. 13, pl. 3.

on either the east or west side were contemporaneous with Pueblo III or later periods. In the mountains of northwestern Arizona all the sites are located near springs or water holes in stream beds, places that have been visited by Indians for a very long time, so that pottery correlations are less reliable as time indicators than on the numberless small sites of the Plateau that were occupied for short periods only. In evaluating dates these facts must be considered.

The Campbells[6] have described a culture with ceramic remains found in the neighborhood of Twenty Nine Palms, California, but the relation of this culture to the prehistoric cultures of the Colorado River area is not at present clear.

As artifacts other than pottery or stone are few in the Colorado Valley, we have no good picture of the culture, except its seeming poverty when compared with the Anasazi and Sinagua cultures of the Plateau and the Hohokam of the desert.[7] However, this poverty may be more fancied than real, since many objects of material culture were probably manufactured of perishable materials as were the products of the later Yuman tribes of the same area.

Brand, Rogers, and the author[8] have pointed out two ancient trade routes across the Colorado River country from the Pacific Coast to Arizona points, the "Northern Arizona-Pacific Trail" crossing the Colorado in the Mohave area and the "Gila-Pacific Trail" farther south. Over these trails in early times shells were transported from

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6 Elizabeth W. Crozer Campbell, *An Archaeological Survey of the Twenty Nine Palms Region* (Southwest Museum Papers, no. 7, 1931).

7 The various cultures in the Southwest during the Christian Era have been given names by archaeologists so that they can be conveniently referred to. The Anasazi, true Pueblo Indians, occupied large parts of southern Utah, southern Colorado, northern New Mexico, and northern Arizona north of the Grand Canyon and east of the Little Colorado River. West of the Little Colorado and south of the Grand Canyon, ranging south to the San Francisco Peaks and to the Chino Valley, was a non-Anasazi Branch or prehistoric tribe, referred to as the Cohonina. South of the Cohonina were two other branches, both non-Anasazi. The branch occupying the area about the San Francisco Mountains and the Verde Valley is known as Sinagua. West of the Sinagua the Prescott Branch centered around the Bradshaw Mountains. In the desert valleys of the Salt and Gila Rivers, the Hohokam occupied permanent villages and practiced irrigation in an extensive way. For further description see Bulletin, Museum of Northern Arizona, no. 17, 1939).

8 Donald D. Brand, *Aboriginal Trade Routes of Sea Shells in the Southwest* (Yearbook, Association of Pacific Coast Geographers, vol. 4, p. 3, 1938); Rogers, *Aboriginal Culture Relations*, p. 5; Harold S. Colton, *Prehistoric Trade in the Southwest* (Scientific Monthly, vol. 52, pp. 308-319, 1941).

the Pacific Coast to the Anasazi in the north and to the Hohokam in the south. In historic times the Yuman tribes of the river valley, particularly the Mohave, were the middlemen and we have early reports of Hopis visiting them on trading expeditions. We have every reason to believe that the predecessors of the Mohaves were just as active traders.

Although we know less about the material culture of the prehistoric inhabitants of the flood plain of the Colorado River than those of the neighboring mountains, an analogy with the Nile furnishes us some clues which archaeologists may have a chance to follow up. Both the Colorado and the Nile rise in highlands that are well watered and flow long distances through deserts to the sea, receiving little or no water on the way.

Both carry large burdens of silt so that where they enter the sea, they have built extensive deltas (both of which lie in almost the same latitude). Although the rivers flow in opposite directions, they have similar climates on their lower reaches. The annual precipitation is very low and the summer intensely hot.

The people of both the valley of the Nile and the Colorado carried on the same kind of agriculture, planting their crops in the area left moist by the retreat of the spring floods. Both starved when the spring floods did not take place.

With geographical factors in the Colorado Valley similar to those of the Nile, one would naturally expect the people to react in a similar manner and make equal progress, but this was not the case. While the Nile Valley for over four thousand years has supported civilized communities, the Colorado Valley supported a population that seemed to be quite backward, according to our standards, when white men first visited them. However, the people of the Colorado Valley are comparable to those of Egypt in the late Stone Age.[9] On the flood plain of the Colorado no evidences of prehistoric culture are found because the river, before the building of Boulder Dam, overflowed its banks each year, destroying the habitations and annually covering the sites with a layer of mud. During the flood period the people retired to the terraces or camped in the neighboring mountains to await the recession of the water just as the people of ancient

9 James H. Breasted, *Ancient Times* (2nd ed., Boston, 1935), p. 31.

Egypt did in the late Stone Age. Neither culture left any remains on the river flood plains, for each year all remains of culture were buried and new houses of brush and mud were raised when the river waters dropped.

The first white visitors found seven Indian tribes, forming a group related in language and material culture, living in the valley of the Lower Colorado. As they all spoke languages related to that of the Yuma tribe that dwelt near the junction of the Gila and Colorado, they are known by the collective term Yuman.[10] When white men first met these Indians of the river, they were not much impressed with their cultural level. The Indians wore few or no clothes, lived in rather crude earth lodges, cremated their dead but did not gather up and preserve the ashes. The white visitors were most impressed with the numbers of Indians in the Colorado Valley, with the abundance of the food produced, by their good baskets and pottery. Although these tribes were separated by over a hundred miles of desert from their nearest neighbors, they had contacts across the deserts on several important routes, and all these routes in early historic times were occupied by tribes related to them in speech and presumably by blood.

The Yumans, wherever found, were war-like and made raids on neighboring tribes and on each other, not for any particular gain, it would seem, but just because they were naturally belligerent. In general they maintained no elaborate military organization, so that their expeditions were usually extemporaneous affairs.

The point of this discussion is as follows: A dense war-like population producing a surplus of food and surrounded by deserts, no matter if they fought among themselves, could not be easily conquered by enemies who had to cross and subsist on those deserts on the way. We can, therefore, postulate that the ancestors of the present Yuman tribes have long lived in the Colorado Valley and have produced a surplus population that radiated out on all the important trails where subsistence was possible. Thus, today we have in Arizona the Maricopa, Halchidoma, Kohuana, and Halyikwamai on the Gila Trail; on the Bill Williams Fork and its tribu-

10 A large literature exists on the ethnology of the Yuman tribes, which there is not space to record here.

taries, the Yavapai; on the Northern Trail, the Walapai and Havasupai. In California, the Kamia are found in the Imperial Valley and the Diegueño near San Diego, while others migrated into lower California.

The idea of a long occupation of the Colorado Valley is also suggested by Klimek[11] who shows that the Hokan language group, to which the Yuman languages belong, is probably one of the oldest groups in California and that Hokan-speaking tribes once occupied nearly all the state. This would indicate great antiquity for the Yuman tribes in the Colorado Valley.

Although we can reason by analogy that the Yuman tribes occupied the Colorado Valley for the past thousand years or more, as Gladwin[12] inferred by calling the prehistoric people of the area Yuman, we do not positively know this to be true. Hargrave[13] proposed for the prehistoric people who once occupied the Colorado Valley the word, Patayan, which he was told by an interpreter meant "old people" in Walapai. Without inquiring too deeply into its etymology he accepted it, because it was easy to say.

Rogers has been studying the ancestral Yumans in the neighborhood of the delta and has recognized three foci representing time intervals.[14] In the north foci have not yet been recognized.

For the purpose of organizing the problem the author considers the Patayan culture or root should be divided into two branches, a southern branch centering about the delta area, which at a suggestion from Rogers he is calling the Laquish Branch, and a northern branch centering about Needles which he has called the Cerbat Branch.[15] This agrees with Kroeber,[16] who on linguistic evidence, divides the Yumans into Delta and River Branches. In other words

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11 Stanislaw Klimek, *Culture Element Distributions: I The Structure of California Indian Culture* (University of California Publications in American Archaeology and Ethnology, vol. 37, no. 1, 1935).

12 Gladwin, *Western Range of the Red-on-buff*, p. 140.

13 Lyndon L. Hargrave, *Results of a Study of the Cohonina Branch of the Patayan Culture in 1938* (Museum Notes, Museum of Northern Arizona, December, 1938).

14 Rogers stated the above in conversation with the author.

15 Colton, *Archaeological Surveys of Northwestern Arizona*, p. 29; *idem*, *Prehistoric Culture Units and their Relationships in Northern Arizona* (Bulletin, Museum of Northern Arizona, no. 17, 1939), p. 25.

16 A. L. Kroeber, *Classification of the Yuman Languages* (University of California Publications in Linguistics, vol. 1, no. 3, 1943), pp. 21-22.

the division is old. In another paper[17] the author placed tentatively in the Patayan Root the Cohonina and Prescott Branches, which between 700 and 1200 A. D. occupied the area between the Grand Canyon and the Bradshaw Mountains in Arizona. Further work on the Cohonina Branch indicates that it has a character intermediate between the Anasazi and the Cerbat Branches. The same relation is true of the Prescott Branch, which seems to be intermediate between the Sinagua and Cerbat Branches. The Cohonina Branch on many counts is not Anasazi; but the Prescott Branch, when compared with its near neighbor, the Sinagua Branch to the east, has many similar characteristics. The pottery of the Sinagua Branch contemporary with Anasazi Basket Maker III has quite a Patayan aspect and perhaps that means a common ancestor. The Cohonina, Sinagua, and Prescott Branches are, nevertheless, distinct cultural units, but it is anybody's guess just how they should be classified at the present. It is quite evident that we know little about the Patayan Root.

CONCLUSION

1. The term Patayan Root has been proposed to include a prehistoric culture with ceramic remains that is neither Anasazi, Mogollon, or Hohokam, the evidences of which are found principally in the lower basin of the Colorado River below Lake Meade.

2. As no one has ever reported upon the excavation of a definite Patayan site, although a number of open sites and cave sites are available for exploration, we know little about the culture, other than its poverty of artifacts. This poverty may be more fancied than real since many objects of material culture were probably manufactured of perishable materials.

3. Although Gladwin inferred with good reason that the Patayan culture was proto-Yuman there are no direct facts to support this view and none to oppose it. On a theoretical basis Gladwin's conception sounds reasonable.

4. We know that the recent Yumans lived on the flood plain of the Colorado Valley, where the evidences of their culture were covered each year by the spring floods. They cremated their dead

17 Colton, *Prehistoric Culture Units*, p. 25.

and did not preserve the ashes or funeral offerings. Although sherds are the only evidence of the ancestral Yumans, whom we call Patayans, we may presume that their culture was similar to that of the recent peoples. Products of a lithic industry found on the river terraces, unassociated with ceramic remains, indicate an even earlier culture.

5. A study of the archaeology of the flood plain would furnish important data, but the project would involve much digging before sites of value could be located. I sometimes think that a reconnaissance expedition could well make use of a steam shovel, at least until evidences of culture are uncovered.

6. The prehistoric culture west of the river should be correlated with that east of the river and the culture of the Yuma area must be correlated with that of the Needles area.

7. The proposed subdivisions of the Patayan Culture are purely tentative and are suggested only as an aid to further research and must not be considered expressions of fact. Before the Patayan Culture can be more accurately defined, archaeologists have much work to do.

MUSEUM OF NORTHERN ARIZONA
FLAGSTAFF, ARIZONA

THE LIPAN APACHE DEATH COMPLEX AND ITS EXTENSIONS

MORRIS EDWARD OPLER

THE PEOPLE INVOLVED: THEIR HISTORY AND LOCATION

THE LIPAN APACHE tribe, whose survivors now live on the Mescalero Apache Indian Reservation in New Mexico, and whose death customs are treated in this paper, separated over 300 years ago from a parent group which once included the ancestors of the Jicarilla Apache and the Kiowa Apache. In the late 17th century the Lipan were already in the northern part of the present state of Texas and were being pressed southward by hostile Comanche. They were in south-central Texas by the middle of the 18th century, and there the Spaniards sought to protect them from their enemies by the erection of the Mission of San Sabá. When this mission was destroyed, two others were built to the south and west to succor these Apache, but they fell in 1767. In 1796, the Lipan reached the Gulf Coast at the lower Rio Grande. For approximately a half century they stayed on the coast or in its vicinity. At the end of this "Gulf Coast period" hostilities between the Texans and the Mexicans involved the Lipan as allies of the latter. Then part of the Kickapoo tribe, which had ceded its lands in Illinois, invaded Texas and became the chief enemy of the Lipan. After an epidemic of smallpox had reduced the tribe, the Lipan were forced northward and westward. One section or band found a haven in the southern spurs of the Guadalupe Mountains of southeastern New Mexico and there made contact with the southernmost settlements of the Mescalero Apache. For convenience I term this band the Northern Lipan. The other section of the tribe crossed the Rio Grande and settled near Zaragosa, Coahuila. The movement of these Southern Lipan to Mexico for permanent residence occurred about 1860 or shortly thereafter. The Southern Lipan, because their contacts with the Mescalero came long after those of the Northern Lipan, are prone to consider themselves the pure or true representatives of Lipan culture.

After 1860 the Northern Lipan became increasingly associated with the Mescalero. When attempts were made to concentrate the Mescalero at Ft Stanton in 1870, many of these Lipan were gathered

into the net. Soon the Southern Lipan were having difficulty with the Mexican military, and a war of extermination was waged against them. The handful of survivors was brought from Coahuila to Chihuahua, and it then became known that some of them had relatives and fellow tribesmen on the Mescalero Reservation in New Mexico. In 1903, a group of nineteen individuals was brought to Mescalero. A superficial knowledge of this episode has given rise to the mistaken impression that the Lipan are merely an offshoot of the Mescalero tribe who became separated from the main group but who were finally reunited with their relatives.

BURIAL, MOURNING, AND PURIFICATION

According to Lipan Apache doctrine, a small whirlwind enters the human body through the throat at birth and provides the vitalizing "wind inside that keeps you alive." Lightning enters the body at this time too and is considered to be the force that "keeps you warm, keeps you alive." To use Lipan phraseology, "When this lightning burns out, the wind comes out and you are gone." Therefore, it is common for Lipan to refer to a person's death by saying, "He burned down." In searching for a modern simile which would convey the concept to me an informant explained, "It is just as it is when a candle burns out or a fuse gives out."

Because of the terror of ghosts and, indeed, of anything associated with death, a body is disposed of as soon as proper arrangements can be made—if possible, on the very day that death occurs. The persons (there are usually two of them) who are asked to care for the corpse and to dispose of it must be advanced in age, for the young and inexperienced are particularly susceptible to disorders growing out of contact with the dead. It is well if the one who undertakes the task has ceremonial power through which the spirits of the dead and their evil influence can be controlled (ghost power). If an elderly relative of the bereaved family possesses such supernatural power he will be approached at this time. Otherwise the services of an unrelated shaman with this attribute are sought.

If it is a man who has died, shots are fired into the air (this is after the introduction of firearms, of course) to notify relatives in the surrounding camps of the disaster. Informants could recall no

purely aboriginal practice which might have suggested this pattern.[1]

When the person who is to take charge of the body is approached he is proffered a cigarette, the usual ceremonial manner of requesting that a ceremony be performed. If that precious commodity, tobacco, is not available, a present of some kind is substituted. The second person or helper has to be secured by the relatives and is paid by them, for "it is hard to get anyone to do it; all are afraid of a dead body."[2]

The old man or woman in charge first washes the body. The hair of the corpse is carefully combed, and his best clothes and jewelry are used in dressing him for the last journey. In recent times a black silk handkerchief, an object lately used in ceremonials to prevent or alleviate "ghost sickness," is placed with the body. If the dead person has no very fine clothes at the time of his passing, relatives contribute garments of their own.

The possessions of the deceased are gathered together, for everything which he owned or frequently handled must be destroyed. These objects and the body are tied to the horse of the deceased, and the animal is led to the place of interment. Any person who meets the burial procession turns away, bows his head, and remains silent until the body has been carried past. Whenever possible, the body is buried in the mountains. To prevent the exposure or washing away of the corpse, care is taken to avoid burying too near an arroyo.

At the grave site a shallow trench is dug. The body, the saddle blanket, and all the personal possessions of the deceased which have been brought are put into it. The body is laid with the head toward the east, and the person in charge places sage in the form of a cross at the head and feet. Then he speaks to the dead person, telling him that he must go away peacefully and alone and must not look back or "bother the relatives in any way." These admonitions are particularly important when the body is that of a person who died while in the prime of life; it is expected that the very young and the very

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1 A Chiricahua Apache, a member of a tribe which also observes this custom, suggested that the trait originated from seeing soldiers shoot over the graves of their dead comrades.

2 Although it is the aboriginal or traditional death complex which is described in this paper, because many of these attitudes and elements persist today, the present tense is used throughout. The reader will understand, of course, that such practices as mountain interment and the destruction of animals have been discontinued.

old will proceed to the afterworld without causing trouble for the living. Next the grave is filled in with earth and stones.

After the burial the horse of the dead person is shot at the grave. The traditional manner is to shoot an arrow into its throat. If the deceased was the owner of many horses, not all of them need be destroyed. The one which carried him to the grave is killed and possibly some others will be sacrified. Usually these are the best and favorite horses of the dead person. The others may be spared. If the dead person owns no horses and a relative's horse is used for the burial journey, the equipment, such as the saddle blanket, is buried with the body, but the horse is led back unharmed. Because of its contact with the dead, however, a horse which has been so used is thoroughly washed, and the mane, over the eyes, and the tail are trimmed.

The burial party always returns to the camps by a route different from the one it took to the grave. To use the same path would be to invite "the ghost or some other evil spirit to follow." After their return the members of the burial party wash themselves thoroughly.

Meanwhile, relatives who are not involved in the burial of the dead signify their bereavement in various ways and take precautions to protect themselves from the ghost. They rip off their good clothes as a mark of grief. They bathe, especially if they have had any contact with the corpse, don old clothes, and cut their hair. Sometimes the bereaved cut bangs over the forehead. Usually, however, the men untie their braids and cut several inches off the ends. They may let the hair hang loose for a time and then bind it again, not tightly, but just enough to keep it together. Young women usually cut the ends of the hair only; old women cut off much more hair. The hair which is cut off at the death of a relative is put out among growing plants in some open, deserted spot. The relatives also ask someone who knows ghost power to sprinkle them with pollen or ashes. At night they burn a sage called "ghost medicine" and smudge themselves in its smoke. Toward evening they sprinkle ashes at the head of the bed in order to discourage visits from ghosts. Or if a child of the household is having a bad dream or a nightmare (a not unusual occurrence during this period of grief, tension, and anxiety) a knife of flint or obsidian (a protective against ghosts) is stuck in the ground at the head of the bed.

Possessions of the dead which are not buried with him are nevertheless destroyed. "All the old things of the dead person are burned; even dishes are put away." The relatives destroy the tipi in which the dead person lived. The explanation given is that "this one was there in good health and they don't want to be reminded of it [his death] so they burn it."

As soon as the burial is over, the immediate family moves camp, always in the opposite direction from the fresh grave. If this is not done "the ghost of the dead or other ghosts will come back to bother them." Even though the move is a token one, it operates as a symbol of distance and as a means of creating an unbridgeable gap between the bereaved and the dead. To be careless in this detail is to open oneself to suspicion, for it is only a witch who lingers around burial sites. In explanation of the move, one informant said, "Sometimes witches put a rock on a grave and say that anyone who camps around it will become sick, die, or have bad luck." All the neighbors as well as the immediate family of the deceased must move camp away from the grave. However, the family of a dying person attempts to minimize the inconvenience for those who are not relatives. For their part, the camp people show respect and concern for the bereaved in a number of ways. The common practices have been described in these words:

> When a man is sick in a big camp, his relatives have regard for the others there and do not want to cause them a great deal of trouble. Suppose a man has come back from war badly wounded. He keeps sinking. He is almost gone. Then they move him far out from the camp. When he dies, they have only a little way to go to the mountains to bury him. All the tipis in the big camp are moved just a few feet or yards. If the man was taken in one direction to die and be buried, the camps are moved in the opposite direction just a little.
>
> The people all roll their tipis down from the top; they have the cover come down half way. This is out of respect, just as the white people have a flag at half-mast.

It is not alone a tribesman's grave that is to be avoided. Any grave and even the graves and remains of enemies can work evil. Explained one informant:

> If a person happens to run across a dead body or a grave, he is worried. He can't be sure it isn't the grave of an evil one [a witch] who will try to do harm. He doesn't know whether it is the grave of a relative of his or not, but he is frightened anyway. No one wants to go around graves, not even if they belong

to members of another tribe. It's all right to kill the enemy in battle, but after they are put away, it's best to be away from them. You don't know whether an evil spirit [ghost] is hanging around the grave.

The immediate relatives of a dead person, or those who lived with him in the same household, stay apart from the rest of the people for four or eight days after his burial. Then friends or relatives invite them to rejoin the larger group again, an indication that they are no longer considered contaminated and unclean. At first they may stay with these friends or relatives. Ordinarily the neighbors, since the household goods of this family have been destroyed, offer them whatever objects of common use they can spare. After a few weeks the household may be reestablished again as a separate unit.

The death of one of its members is a crisis which all those who live nearby must help the family to surmount and forget. "After a death people go to visit the family. They tell them stories of old times, stories about buffalo hunting, something to cheer them up and keep their minds off their troubles."

To think of or to dream about ghosts or the dead is to "draw" their baneful attention. Therefore mention of the dead is discouraged. If one of two relatives who are addressed by the same kinship term dies, a person is careful not to use the term to the survivor for some time "because it will remind him of his dead relative and he will feel badly." Moreover, there is strong reluctance to use the name of the dead person. Relatives do not dare to use the name of their deceased kinsman. Others, especially in the presence of a relative of the dead person, must couple any mention of the dead with the respectful circumlocution "who used to be called." Bloody feuds have been precipitated by a disregard of this convention.

Since death is not only an unfortunate but also a contaminating and fearful event, it is an ill omen if it strikes when a ceremony or a celebration is pending or is in progress. Consequently, "if someone in the neighborhood is very sick and it is believed that death is near, the Lipan will not hold a feast. If the person dies during the good time it would bring bad luck. So it is the Lipan way to wait until about a month after the death." Even the girl's puberty rite and the accompanying feast are halted at a death in the vicinity and may not be resumed and completed until a month has elapsed. Curing

rites, of course, cannot be postponed this long, but ordinarily a ceremony is halted at news of death in a nearby camp. Then a day and night are allowed to intervene, and the ceremony is begun anew on the succeeding night.

The presence of death and contact with the corpse are so disagreeable to the Lipan that relatives are especially grateful to a slain warrior's companions who recover and bury his body. When this deed is reported, the bereaved "come with presents and say, 'This is for you, for what you did for our relative. You tried to protect him, but he was killed. It was not your fault. But you took good care of him and buried him with something good over him.' "

VARIATIONS IN ATTITUDE ACCORDING TO THE AGE OF THE DECEASED

The burial practices and the associated attitudes described to this point are those which are ordinarily encountered. But variations from the pattern occur when the deceased is an infant or an aged person. These gradations of fear and differences in observance have been expressed in these words:

> If a little baby dies, they do not throw many things away. They are not afraid of it. They say it was just a "dewdrop." They bury it up on the hill. The relatives themselves bury it. They don't have to hire someone. They move camp a little way. If the child was over a month old, it would be considered more of a person and they would be more careful. If the child dies while it is still young enough to use the rawhide carrier,[3] the carrier and the child are buried together in the grave.
>
> If a young person dies, say at twenty or thirty years of age, they have to cry for him. If a person is very old but is still moving around and active they cry for that person when he dies but not for long—only for one day. But when a person who is "ripe," who is helpless, dies, they don't have to cry at all.
>
> When such a very old person dies, they bury his own personal things with him, but they do not destroy their own things. If a young person dies, they have to throw away some of their own things too, anything that an active person might have come in contact with while he lived.

It is when the deceased has passed on as a result of the ultimate in natural causes, namely, old age, that fear and precaution disappear almost entirely, and a blessing rather than a persecution is expected from the deceased:

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3 The Lipan claim that they did not use a cradle with frame and canopy until they had contact with the Mescalero Apache. Their baby carrier or "baby rawhide" was a piece of rawhide that folded around the baby and was laced up in front.

When a very old person dies, they don't have to cry for him. When an old person is "ripe" the skin comes peeling off just as it does from yucca fruit when it is very ripe. When they go back to their second childhood and want to play like children, the relatives know they are going to die soon. Then all the relatives gather for a last blessing from this old person. They do not have to cry for this old person when he dies. He has lived pretty well and lived his life out fully. He becomes very ripe and then drops like a ripe fruit.[4] They have nothing to fear from him.

This ceremony of the last blessing which has been mentioned is also in part the burial rite for the aged and dying relative. Yet the attitudes differ conspicuously from those exhibited at the death or burial of a younger, vigorous person. Relatives, old and young, show no fear of the dying person, the burial place, or the body. The occasion becomes instead a supplication for longevity and good fortune:

They have fruits of all kinds there—yucca, mesquite beans, and others.[5] And they have red paint and pollen. They are going to have a ceremony so that they, too, will all become old like this one who is soon going to leave them and go back to the place from which he came.[6]

Then some other old person who knows the rites of death paints all the relatives. The very old one can't do it. He is too old to move about; he is dying, and the flesh is peeling from him, though he can't feel it.

Then they move camp. The old person is not going to be moved when he dies. That place will be his grave. After he is dead they dig a little trench for the body and put the fruit on the grave. All the relatives want to do it; they want to give something to this aged person. As they do it they ask for long life and good luck.

The paint is kept on by the relatives for that one day only. They move their camps just a short distance.[7]

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4 In the mythological period a supernatural known as Walking Rock had charge of the fruit and of old age. It was he who decreed that man should pass through the same phases of life as the fruit. See Morris Edward Opler, *Myths and Legends of the Lipan Apache Indians* (Memoirs, American Folk-Lore Society, vol. 34, 1940), pp. 38-39.

5 Note the association of ripe fruit, age, and death—a common Apache thought.

6 The Lipan believe that man emerged from an underworld in the beginning and, as will be explained later in the paper, most Lipan, though not all, accept that the afterworld is the "place below" from which mankind originally came.

7 In two psychologically pointed papers, I have interpreted the Apache fear of the ghosts of relatives in terms of the tensions of the social system and the rivalries of real life. The absence of fear of the ghosts of infants and of the aged is accounted for by the fact that personality clashes and rivalries had not begun in the case of the former and were terminated before death by helplessness and senility in the case of the latter. See *An Interpretation of Ambivalence of Two American Indian Tribes* (Jour-

THE AFTERWORLD

The spirits of the dead, called "ghosts," make their way to an afterworld. The exact location of this abode of the dead is in dispute. The term for it literally means "place below" and most informants describe it as an underworld:

> The dead go to "place below." Those down there they call "ghosts." The things destroyed at a death and the things buried with the dead and the horse killed for him all go to "place below" with him. This place is the one where the people came from in the beginning. The dead are going back where they came from, they say.

There are a number of stories which describe the afterworld as a place below and which give various details about it and its inhabitants. One tale recounts the adventures of a Lipan shot during a battle with the Mexicans. He goes down a steep place to a beautiful country. Near a grove of cottonwood trees he sees a group of men playing the hoop and pole game, among them his long-deceased father. His father sends a messenger to tell him that it is not yet time for him to remain in the land of the dead. But he stays long enough to learn that those who were kindly in life enjoy plenty and pleasure in the beautiful southern half of the underworld. Those who were sorcerers while they lived are condemned to exist in perpetual darkness in the northern half where they find nothing to eat but lizards, snakes, and horned toads.[8] When he learns that he may not remain in the underworld, this Lipan runs up a trail and into his own body again. He regains consciousness and relates his experience to his relatives and neighbors.[9]

Another tale which depicts a lower world for the dead concerns a woman who is thrown violently from a horse and who finds herself traveling to the afterworld. She passes two juniper trees[10] from which the parts of bodies of the maimed hang. As they pass the trees on their way to the land of the dead, the owners claim the

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nal of Social Psychology, vol. 7, pp. 82-116, 1936), and *Further Comparative Anthropological Data Bearing on the Solution of a Psychological Problem* (Journal of Social Psychology, vol. 9, pp. 477-483, 1938).

8 The Jicarilla, too, speak of a similar division of the underworld into northern and southern sections and of the punishment meted out to witches after their death.

9 See Opler, *Myths and Legends*, pp. 97-98.

10 Juniper trees often appear in these tales and mark the approaches to the land of the dead.

missing parts and enter the underworld whole and restored once more. The newcomer passes an old woman who is gathering the fruit of the prickly pear cactus, but this woman ignores her. She comes to a steep incline and looks down upon a circle of men seated below. Suddenly the earth at the edge of the steep place crumbles and she is carried down. She is directed to the camp of her parents, but her father turns her away, saying, "Come when you are poor and ragged." She turns back and at length reaches her body, enters it, and recovers. It is explained in the tale that the old woman whom she passed is the one in charge of the underworld and that if the fruit she was picking had been proffered and eaten, the visitor to the underworld could not have returned to life.[11]

Another story which contains similar elements relates the adventures of a Mexican who lives among the Lipan Apache for many years, marries a Lipan wife, and becomes a Lipan culturally. The couple have a child who dies. The man grieves for his daughter so constantly and thinks of the dead so often that he becomes ill and finally lapses into unconsciousness. He then finds himself following a trail and comes to a bluff. Below he sees a circle of men smoking and passing a pipe. The soft earth gives way beneath his feet and he is carried down to them. He notices that each man, when it is his turn to smoke, puffs the smoke upward, mentions the name of a living relative, and says, "May he come soon." The tipi of his dead relatives is pointed out to him and he goes there. His beloved daughter is playing there but she does not recognize him. Other relatives tell him it is not yet time for him to join them. Stung, he finds a different path and returns to his body and to life. It is explained that if the man had been really dead, the men he first encountered would have offered him the pipe or he would have been offered fruit of the underworld to eat.[12]

Still another narrative tells of a man who is "killed" in battle. He finds himself walking along a well-beaten trail. As he pauses and leans against a juniper tree, three others who have been slain in the same fight pass by and urge him to hurry. They continue to the edge of a bluff and disappear. This man looks ahead but does

11 See Opler, *Myths and Legends*, pp. 98-100.
12 *Op. cit.*, pp. 100-101.

not see anything. He looks behind and sees his body. He reenters it and comes to life.[13]

The last of these accounts of the underworld which will be summarized here has to do with eight Lipan youths who are on a raiding expedition. They follow tracks and come to some prickly pear cactus plants. In spite of the warnings of his companions, one of the young men eats some of the fruit. He becomes obsessed then with the desire to follow the tracks farther, though they lead into a body of water. After his disappearance his friends wait for him. At night they see fires under the water and hear laughter and noise as though games were being played. They hear their friend's name mentioned. They wait two days and two nights more but he does not reappear. They decide that he has returned to the underworld from which the people originally emerged and continue their journey.[14]

On the other hand, informants have been equally positive about locating the afterworld on the earth's surface:

> There is no lower world of the dead. It is all up here. The dead live right on this earth, but you can't see them. They camp some distance from the people. They may be in a mountain valley or somewhere else, but you will not be able to see them. They have to stay apart from the living people. We call the afterworld "place below" but that does not mean a lower world. It is just a name.

A story is told that tends to support this version of the afterworld too. It relates how a little girl, who is on horseback, gets lost. She is caught in a thunderstorm, dismounts, and seeks shelter under some trees. At a clap of thunder and a flash of lightning, her dead father, who had been a shaman of the lightning ceremony, appears. He covers her face and takes her to an encampment. She hears the voices of her grandmother and of playmates who have died. But her father warns her not to join them or look upon them if she wishes to see her living mother again. Her grandmother wishes her to stay with them in the encampment of the dead, but her father is resolved to restore her to her living relatives once more. He tells her that on a certain day the living are going to break camp and move, and the dead will follow to dwell, unseen, near them. At that time he plans to take her back. The day comes and the dead people

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13 *Op. cit.*, pp. 105-106.
14 *Op. cit.*, pp. 41-42.

make ready to move. The girl's face is covered once more and she is carried to a hill. Her father cannot approach nearer to the dwellings of the living but gives her the necessary directions. He explains that she will pass four scouts of the dead who have been sent to spy upon the living and who will have the form of quails. She is instructed to wash herself and her clothes thoroughly before joining her living kin and to rub dirt on her clothes so that they will not spread sickness among the living. She is told that she must not take her doll with her because it has been in the tipis of the dead. And it is explained to her that she may not stay with her father and her grandmother because nothing has "killed" her. She is assured that when she grows old she will return to them.[15]

But, whatever their destination, ghosts, with the exception of the spirits of infants and the aged, are held in dread by all Lipan. This apprehension derives from two primary traits attributed to the ghost: (1) his ability to return to his grave or to the habitations of the living and to persecute relatives for sins of omission or commission in respect to him, and (2) his inclination "to draw" or to lead living relatives to the company of the dead.

It is because of the first of these traits of the ghost that the grave of the dead kinsman is so carefully avoided and that all injunctions concerning the destruction and disposal of his property are so sedulously obeyed. There must be nothing in behavior or speech and no material object to "draw" the ghost. Yet, in spite of all precautions, fear on this score can never be entirely abolished. If relations with the dead person were strained or unsatisfactory or if the departed were really a "witch" (and since the Apache witches "work and kill" in secret there can be no guarantee that this is not so) there is always the possibility of unpleasant encounters. In fact, anything eerie or inexplicable, or hysterical seizures and evidences of extreme terror, are attributed to the activities of ghosts:

> Everyone is afraid of the ghost. When someone faints all of a sudden we say a ghost did it. When a person goes insane, bites himself, we say a ghost did it. Perhaps before this that person was going to have a long life. Now the ghost cuts it short.

The tendency to explain anything frightening or obscure in

15 *Op. cit.*, pp. 101-104.

terms of ghosts is illustrated by the following episode which was told to me by one of my informants:

At J.'s mother's camp [a Lipan woman] a little while ago J. M. [also a Lipan woman] and a Mescalero Apache woman were visiting. The three women heard a roaring outside. They rushed out to see what it was. They thought it was something down the road. They waited for an automobile to come by. The sound went by but no car. The two Lipan women said to each other, "It must be ghosts." The Mescalero woman didn't understand, for they used the word bak'oc for ghost.

"What does bak'oc mean?" she asked.

"Oh, we mean the same as t'cidn [the Mescalero term for ghost] by that," they told her.

Later someone asked, "Did you hear the airplane?" That's what it had been but these old women didn't know it.

GHOSTS AND OWLS

"Mean" persons and "bad" or "evil" individuals (witches) are likely to assume the form of an owl when they return after death to cause illness or to persecute the living.[16] The objects of their unwelcome attention are usually relatives against whom they have a complaint or bear a grudge. The common belief has been summed up for me in these words:

When a mean person dies he goes to the afterworld like the others. Then his bad spirit comes back to earth and takes the form of an owl. Therefore we don't like to hear the owl hoot. They say it is just like a Lipan Indian's voice. People hear it say, "I am your grandfather. I am your relative." That's just a bad ghost they are hearing. It is just the bad ones who come back to bother you like this. We believe that it is dangerous to whistle at night, for it draws these evil spirits.

If an owl hoots close to camp, it is best to drive him away. It's best to throw sticks and rocks at him, telling him that he has gone to the place where he wants to go and that he should stay there and stop bothering the people.

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16 The Lipan explanation for this is as follows. During the time when animals were just like people, Big Owl was one of a number of evil creatures who sought to keep the world in perpetual darkness. His side was bested in a "hidden ball" contest, the moccasin game, which was played to determine whether this condition should prevail. In the fighting that broke out at the end of the game, Big Owl was slain. From his body came the owl of today which retained Big Owl's evil characteristics and promptly aligned itself with the forces of darkness, the ghosts (see Opler, *Myths and Legends*, p. 94). In the Lipan story of the first death, Owl's association with the dead is underscored by having him offer to take care of the body (*ibid.*, p. 89).

Because of the other important characteristic with which ghosts are credited, that of being harbingers of death and guides to the afterworld, the mental image of the dead is most unlucky. Recovery from critical illnesses consequently becomes an escape from relatives who have gone before. To accept the hospitality of the ghosts by taking food (fruit) which they offer seems to be the dividing line between coma and true death. The behavior of the feverish and the delirious has made this easy for the Lipan to accept. As one informant phrased it:

> They say that when a person is very sick, his dead relatives come back for him. When he is dying he sees things that no others can see. He talks to people that no one else can see. They bring him food, and if he eats it he cannot recover.

There are many tales to illustrate the part which the ancestors play in the fate and in the time of demise of the living. The one that follows, told to me by an old Lipan woman, is typical of its kind:

> My grandmother was riding a horse. The horse ran away, and when she fell, dragged her along and "killed" her. She went below [to the afterworld]. Then she saw her own grandmother and said, "Grandmother, I have come." Her grandmother said, "No, my grandchild, it is not your time yet." Her grandmother had some prickly pear fruit there. She said, "If you were to stay here, you could eat this, but it is not time yet. Do not eat this fruit but go back."
>
> So my grandmother, after lying there "dead" all day, came back to life, got to camp, and told the others of her experience.

It will be remembered that in the stories we have already reviewed describing the underworld, this theme was repeated a number of times. Since those who are in a position to make these revelations concerning the afterworld and the spirits of the departed are the ones who have not been detained in the afterworld, the recitals follow this pattern closely. It is assumed that those who do not return to consciousness and life were induced by their dead kin to taste the fatal fruit.

DEATH, MARRIAGE, AND RE-MARRIAGE

Marriage among the Lipan is an understanding between families rather than between individuals and particularly entails obligations between a married person and the relatives of his mate. Since residence is ordinarly matrilocal, the obligations of the married man

to his wife's relatives are more in evidence, but the woman is bound to her relatives by marriage by ties that are quite as strong ideologically, though they are not so onerous practically. It is at the time of a death that the duties of the survivor to the family of the deceased mate are revealed most sharply.

There are reasons for the Lipan Apache to be grim and demanding concerning their right to control a bereaved affinal relative. For one thing, the structure of Lipan society encourages this. Relatives by marriage, particularly sons-in-law, are the mainstay of the family system of economy and protection. One of my informants illustrated this by means of a narrative about a Mescalero who married a Lipan woman and then deserted her and her relatives at a time of great danger. His wife was killed, and this man was therefore at the disposal of her family, most of whose members were ready to take revenge. A kindly relative of the man's wife saved his life, but it cost the widower much wealth to "buy his way out," to gain permission to sever his relations with this family, and to marry into another kinship group. It is interesting that a Mescalero appears as the faithless husband and relative-in-law. The Lipan ideal which this unlucky man was alleged to have violated was described thus at the end of the tale:

> According to Lipan custom a man marries a girl and lives with her people in their camp. Perhaps they put the camp near a dangerous trail. Still he must protect the whole camp. These women respect him and he is supposed to protect them. That was understood by him. That Mescalero ran away, but a Lipan wouldn't do that. He would have been killed right beside his wife, with his own people. If there is a battle, the son-in-law must be the brave one. He must be in the thick of the fight.
>
> A son-in-law, when he spies the enemy a day's march away, comes back to the camp. Or if any scout comes in with a message about something in the distance, the people in the camp say, "We'll send our son-in-law over there." It's dangerous. There may be enemies there. But he has to go. It's his duty to protect his wife's people and do what they tell him to do. He gets over there to find out what it is. He comes back and tells them. If it is buffalos or wild horses, they fix up their best horses to go out to get meat or horses. If the enemy is there, they prepare to fight.

There is another structural or functional reason for the Lipan husband to be bound to his wife's family by ties that continue even after her death. The primary Lipan social group responsible for

economy and defense is the extended family consisting of parents, daughters, unmarried sons, and sons-in-law. The death of an adult woman is disruptive enough, but if it inevitably meant the departure of an adult male and the additional care of dependent children, the dislocation would be most serious. The society guards against this by a sororate-levirate arrangement in accordance with which the survivor in a marriage terminated by death is bound to his deceased mate's relatives. He must marry a sibling or a cousin of his dead mate if they insist, or must buy his way out at a heavy price if they are unwilling to release him.

If there are two sisters, one married and one unmarried, and the married sister dies, the sister left alive can marry that man if she wants to. She can take her dead sister's place. It's according to how the family feels about it.

If there are two brothers and the one of them who is married dies, the other should marry the widow. If he doesn't want to, a cousin of the husband could take his place. They feel that the girl should stay in that family. Perhaps the family likes the girl very much and doesn't want to lose her. If the dead man has a nephew or a young male uncle near his age, it will be all right for one of them to marry the widow.

There are, moreover, psychological explanations of the severe and unyielding supervision of the widow or widower by the relatives of the dead spouse. It is not unlikely that feelings of aggression against the outsider who has invaded the close family circle are unconsciously satisfied within a traditional framework at this time. And it is possible that feelings of guilt concerning the relations with the deceased are projected now upon this convenient scapegoat. At this uneasy period, when fear of the dead is dominant, the maintenance of a virtuous watch on the conduct of the survivor in the name of the honor of the dead must be salve to a troubled conscience. In addition, the prestige and authority of the family are at stake. The human tie that bound the relative by marriage to his tasks and obligations has been eliminated. Moral and social understandings, backed by penalties, remain. It is a doomed and disintegrating family which cannot enforce them. Without an appreciation of these strong underlying motives, the somewhat sadistic and inquisitorial tinge in the demands made of the widow or widower cannot be completely comprehended. Only source materials can convey the feeling tones involved:

If a man's wife dies, he stays with her people. He "belongs to" his dead wife's people. He has to keep on working for those people. He does not dress well. He is ragged and "poor" and doesn't comb his hair. He shows his grief this way. But he goes out and hunts and gets something to eat for them. If they have a girl, a sister of the one who died, and she wants to marry him, after a year these two will be married. He gives a little present at the time.[17]

If they have no girl to give him or if the girl doesn't want to marry him, they turn him free. They say to him, "You have worked well for us and we have no one to give you, so you can go." But if he marries again he will give some present, a horse or a buckskin, to his former wife's people to show that he still respects them.

So you can see that one who "belongs to" a family in this way must be careful. He can't go with a girl of another family. The family of his dead wife watches him. If he goes around with someone else or won't listen, there is trouble. If he goes off and gets married without the permission of his dead wife's relatives, they will come along and take his horses or his gun or saddle, whatever he has. If he hasn't anything he'd better watch out; he'll get cut up.

Moreover, the anger and aggression of the injured family are turned upon anyone who encourages the disrespectful behavior of one who is "bound to" them by the affinal system and the sororate:

The parents of the dead girl are very angry at a new wife that a man has taken without their permission. They may stab the new wife or take some of her property. To prevent this, the relatives of the new wife sometimes take presents to the relatives of the dead girl. If they accept them the man is free and that is all right.

To illustrate the "big quarrels" which start from violation of these conventions, the following story was told to me. Again, one of the protagonists is said to be a Mescalero Apache, but since the Mescalero practice an identical custom and since it is the sentiments and reaction of the Lipan which are being described, the episode is relevant to our discussion.

My mother's maternal aunt, a long time ago, married a Mescalero. This woman got killed. The man, without getting his wife's relatives' permission, married again. They never forgot it, her people. A long time afterward, at

17 The sororate still takes precedence over personal wishes as the following modern incident demonstrates: "P. is that old Lipan man. His one daughter died over a year ago. His other daughter has just asked R., the widower, to marry her. This girl has never been married before. R. was intending to marry someone else. Then his dead wife's sister came to him and reminded him that he was 'bound to' her. He did not marry the other woman therefore but will marry his dead wife's sister. The couple intend to live at P.'s camp. R. has not gone around at all with this girl he is going to marry."

Indian Springs, there was trouble. A woman, a relative of the one who had been married to him, came up to him and said, "A long time ago you were 'bound to' us. Then you went off and married again without asking us about it. Now take this!" She stabbed him. He grew very angry. He took the knife away from the woman and killed her right there. Two of his relatives got killed in that fight too.

The widow is under careful scrutiny by her dead husband's kin also, and any laxity in mourning or any sign of disrespect to the memory of the dead man will bring an immediate protest:

When a woman's husband dies, his family watches her. As soon as they hear that she had done anything bad, relatives of her dead husband go right over there. Some woman of the family might cut her nose or cut an ear off the woman's head.[18] If they are fighting, this widow may have her nose bitten off. They only do that as a last step if the woman won't behave. They aim to bring about a more peaceful settlement.

In case a dead man's family does not entirely trust his widow or wishes to exercise control over her, in spite of the convention of matrilocal residence, its members may even request that she live in their encampment during the period of mourning.

Sometimes when a girl's husband died, she came to live with his people or she camped near them. Later on they might marry her to a brother or a cousin of the dead man. If not, they might tell her, "Now you can go back to your people." If she still respects her former husband's people, she will give them a little present. If they are angry because she doesn't respect them, they take something away from her by force.

The contamination of death falls most heavily upon the one who has been physically closest to the deceased, upon his mate if he was married. Therefore anyone who remarries after the death of his partner, whether he chooses a sibling or a cousin of his mate or someone from another family, must undergo a purification ceremony. The typical occasion on which the ritual is used and the ritual itself are described in the following account:

When someone dies, say a woman, her people and her husband go down to the spring and bathe. They have been with the woman who died and perhaps her breath has sunk into them or is in their hair or ears. So they wash thoroughly. They wash all their clothes well too, for perhaps the dead woman was

18 To cut off the tip of the nose or the ear of a woman is punishment for adultery. The implication is that any unauthorized relations with men of which a woman "bound to" them is guilty is tantamount to adultery.

working and sweating and touched their clothes. Sometimes they throw the clothes away.

After that they go to a man or woman who knows ghost power. This person burns sage and they get the smoke all over themselves. They have cut the ends of their hair and thrown away the bedding and the personal possessions of the dead one. The one who burns the sage for them does it so the ghost will not come back to bother them or to give them bad dreams, for unless this is done, sometimes the children have nightmare and run out of the house. And the relatives and the husband of the woman who is dead dress in gunny sacks or flour sacks. They dress poorly for about six months or a year.

After a year or so, if they have not offered another woman to the widower, perhaps his own people will want him to get married. So they come to the parents of the dead woman and say, "We want our boy to get married now and we have a certain girl in mind for him." They give presents to the woman's people. The widower, too, acts in a respectful way and gives them presents. He buys his way out.

Then they say, "All right, you have done the right thing and have come and told us. Now you are free to do what you want to. We are glad you did it this way. There will be no trouble. If you had not told us your intentions perhaps we would have had trouble."

When the man is freed, when he has waited a year and has got the permission of the relatives-in-law, he and the woman he is going to marry go to an old man or woman who knows how, who knows the traditions about marriage, about when man and woman first got married in the beginning, and asks for a blessing. They give him some present, like a gun or a horse and he holds a ceremony over them so that no bad luck will follow them. Before the shaman touches them he has to take them to a spring and wash them after splashing water on them four times. Then they wash themselves. While they are bathing, the shaman says to them, "Now all the ghosts are washed away. Now have only good in your heart." Next the shaman paints their faces with red clay. He marks them with pollen and white clay too. Then they are free to marry.

If a man was careless and didn't have this ceremony, people would say, "He's in a bad fix. He will have bad luck all the time. He will lose his next wife too or the children perhaps."

SUMMARY STATEMENT AND CONCLUSION

From this review of the materials which have to do with Lipan death and burial customs it is quite evident that a summary limited to a description of the manner of disposal of the dead and the most obvious mourning practices would hardly do justice to the complexities and inter-relationships of the subject. Instead we find that the extensions of the death complex involve almost every aspect of Lipan thought and life. Attitudes toward childhood are conditioned

by the fear of ghosts and ghost sickness; childhood is the particularly susceptible period.[19] Death can terminate celebrations and delay ceremonies. On the other hand, purification and remarriage rituals draw their characteristics from the prevailing conceptions concerning death and the relations of the dead to the living. The destruction of the property of the dead and the movement of the encampment whenever death strikes has a markedly limiting effect on the economy. By the strict application of a levirate-sororate, the social system has undertaken to minimize the economic and familial disruptions occasioned by death. The theory of ghosts and the characteristics of ghost fears point to some of the more serious conflicts within the social framework and to the manner in which they are repressed. A rich body of folklore has grown up which preserves the Lipan conceptions of the afterworld and of the animals and beings associated with the death complex. This many-sided response to the fact of death suggests that there are probably no isolated *rites de passage*. More likely the totality of a culture, in all its material and psychological aspects, responds in varying degrees to the recurring crises that living and dying impose.

19 This idea may have arisen because of high infant mortality.

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INFERENCE OF RELATIVE AGE OF CULTURE TRAITS FROM MAGNITUDE OF DISTRIBUTION

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I HAVE always been somewhat skeptical of the value of a discussion of method *per se;* for no method *per se* seems capable of doing what needs to be done. On the other hand, method is essentially a tool, a way and means of doing things; and, for a given task, a good tool is preferable to a poor one. Yet the fact remains that poor work can be done with a good tool, and, in some fields, good results can be achieved with a poor tool.

The inadequacy of the tool, of course, depends upon the task in hand; and some men make the tool as they proceed. One feels, moreover, that the method and the task are not two things, though clearly distinguishable, but actually are parts of one indivisible enterprise. Perhaps that is why a discussion of sheer method, as though method had in itself some prime virtue, is likely to seem sterile, and to be barren of results outside the field of dialectic. One might recite the adventures of the man who learned that in mathematics two and two add up to four; and then was discomfited to find, when he visited his lion's cage, that the two kids which he had placed with the two lions had added up to two animals, with no remainder as a reminder. I suppose he learned to distinguish, thereafter, between the surety of pure mathematics and the vagaries of a zoological garden and its inmates.

If, however, good methods do not guarantee the best results, much less do poor methods ensure them. Certainly in the long run the former will be more justified of their fruits than will the latter. Every method, if it can be said to have any validity, rests, and must rest, on certain logical presuppositions, whether or not these are formulated; and no method is better than the logical presuppositions on which it rests.

In the remarks that follow I shall cite the application of a method to a problem. My purpose is to illustrate what is done and what is not done; and to use this as an illustration of a larger principle which legitimate procedure must follow. If I refer to certain views of desig-

nated individuals as illustrative of what in this connection seems to me inadequacy, and often sheer error, this is not to imply that I do not value highly most other contributions made by those same persons. It is precisely because the work of these persons has been important and of high standard that I take them as illustrations. It would be futile to ferret out the inadequacies of the obviously inept. Even Newton had some horrible moments; and some of Shakespeare's lines are beneath any common punster. If some of our eminent contemporaries have had their off moments, they at least are in good and large company.

When evidence fails, or is noncommital, men resort to divination. The unknown is solved by astrology, palmistry, crystal-gazing, or trysts with Providence. African natives pitch the bones; or give the disputants, or their dogs or chickens, a dose of poison, and read the truth in the results.

Some ethnologists plot on a map the distributions of respective culture traits, ascertain the magnitudes of the areas of distribution, rub out the word *space,* write in the word *time,* and thus solve the problem of the relative age of traits. Distributions viewed on a horizontal plane are geography; read on a vertical plane, they become history. Perhaps the simplicity and all-inclusiveness of this transformation of dimensions should make us skeptical of its validity.

We believe this procedure is not justified. If, moreover, the principle were established that the more widely spread traits are older than those with less magnitude of distribution, this correspondence would not justify a reconstruction of culture history on the basis of geography unless there was a very high degree of known correspondence between magnitude of distribution and age of the trait.

The suggestion that magnitude of distribution is an index of the age of a trait has a fairly long history in professional anthropology. In 1872 Colonel A. Lane-Fox remarked:

> The earliest inhabitants of the globe, as they spread themselves over the earth, would carry with them the rudiments of culture which they possessed, and we should naturally expect to find that the most primitive arts were, in the first instance, the most widely disseminated. Amongst the primeval weapons of the Australians I have traced the boomerang, and the rudimentary parrying

shield—which latter is especially a primitive implement—to the Dravidian races of the Indian Peninsula and to the ancient Egyptians.[1]

In *Myth, Ritual, and Religion* (1887), Andrew Lang says: "If the myth be one which encounters us in every quarter, nay in every obscure nook of the globe, we may plausibly regard it as ancient." In 1896, George L. Gomme, in a discussion of folklore, published in the *Report of the British Association for the Advancement of Science* (pp. 626-656), and summarized in 1908 in his book, *Folklore as an Historical Science*,[2] elaborates a plan for inferring the relative age of elements, or motives, in the plot of a myth which has considerable distribution and also has local variants. Elements which are common to all areas he considers the original elements, and the other elements, later modifications or additions. If, for example, of elements a, b, c, d, e, f, g, elements d, e, f, are everywhere present, then d, e, f, are the original elements.

In 1902, Stewart Culin remarked that

> the wide distribution and range of variations in the dice games [of the American Indians] point to their high antiquity, of which objective evidence is afforded in the prehistoric stick dice from the cliff-ruins of Colorado. Similar evidence exists in the pottery bowls decorated with representations of gaming sticks, with their peculiar markings, from prehistoric Hopi graves in Arizona. Small bone dice are found in the prehistoric graves and ruins of Arizona, New Mexico, and Utah.[3]

Similarly, the alternate spur designs on Eskimo needle-cases Boas considers "in view of their wide distribution over the whole Eskimo area . . . a very old possession of the Eskimo."[4] In 1916, Wissler observes, when writing about types of Eskimo harpoons: "The natural conclusion would be that the more widely distributed [spur on Eskimo harpoons] is by far the older form and the restricted screw is the more recent."[5] The possibility that the alternate spur design

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1 Colonel A. Lane-Fox, Presidential Address to the British Association for the Advancement of Science, Section D (Nature, vol. 6, 1872), p. 323.

2 London, 1908, pp. 167-169.

3 Stewart Culin, *Games of the North American Indians* (Twenty-fourth Annual Report, Bureau of American Ethnology, 1907), p. 48.

4 Franz Boas, *Decorative Designs of Alaskan Needle-Cases* (Proceedings, United States National Museum, vol. 34, pp. 321-344, 1908; reprinted in Franz Boas, *Race, Language and Culture*, New York, 1940, pp. 564-592), p. 569; see also p. 589.

5 Clark Wissler, *Harpoons and Darts in the Stefánsson Collection* (Anthropological Papers, American Museum of Natural History, vol. 14, pt. 2, 1916), p. 443.

spread more recently than certain other often associated designs which are not as widely distributed Boas does not mention. A trait which is widely spread is assumed to have diffused in the remote past rather than recently; but no justification for the assumption that a widely diffused trait is old is offered. The question remains: If a trait can have spread widely a long time ago, why can it not have spread widely in recent times?

In 1909, W. H. R. Rivers suggested that in Mota and Motlav totemism arose subsequently to exogamy:[6] whereas Frazer speaks of "totemism stripped of its later adjunct, exogamy."[7]

> It is [Boas says] admissible to judge the antiquity of an ethnic phenomenon by its universality. The use of stone, fire, language, is exceedingly old, and it is now universal. On this basis it is justifiable to assume that exogamy also is very old. The alternative assumption, that a phenomenon of universal occurrence is due to a psychic necessity that leads to it regularly, can be made for the kinship group, not for the other cases. We may, therefore, consider exogamy as the condition on which totemism arose.[8]

In 1923, in his *Anthropology,* Alfred L. Kroeber reconstructs New World history on the basis of magnitude of distribution of the respective traits, merely writing *history* where the facts spell *magnitude of distribution;* and Ruth Benedict says: "In general, the larger the area of distribution, the older we may judge the trait to be."[9] A year later, Lowie[10] champions the hypothesis that the most widely distributed forms of treating disease are the oldest forms; and thus paves the way for Clements' contribution in this field, which tells us, by measuring distribution, how Upper Paleolithic man diagnosed disease.[11] In 1940, Lowie says, when describing the Fuegians:

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6 W. H. R. Rivers, *Totemism in Polynesia and Melanesia* (Journal, Royal Anthropological Institute, vol. 39, pp. 156-180, 1909), p. 175.

7 James G. Frazer, *Totemism and Exogamy* (4 vols., London, 1910), vol. 2, p. 89.

8 Franz Boas, *Tsimshian Mythology* (Thirty-first Annual Report, Bureau of American Ethnology, 1916, p. 518; reprinted in Franz Boas, *Race, Language and Culture,* New York, 1940, pp. 316-323), p. 320; see also p. 380. The last sentence quoted above is not in *Tsimshian Mythology.*

9 Ruth Benedict, *The Concept of the Guardian Spirit in North America* (Memoirs, American Anthropological Association, no. 29, 1923), p. 62.

10 Robert H. Lowie, *On the Historical Connection Between Certain Old World and New World Beliefs* (Compte-Rendu, XXI Congrès International des Américanistes, 2nd part, Göteborg, pp. 546-549, 1925).

11 Forrest E. Clements, *Primitive Concepts of Disease* (University of California Publications in American Archaeology and Ethnology, vol. 32, no. 2, 1932).

> The cure of disease by suction is so wide-spread that it may be a veritably ancient human conception. On that assumption its retention by the Fuegians shows how stable certain phases of belief can be. [A curious circular reasoning] . . . The resemblance between Ona and Australian hordes is probably merely the result of independent development from similar antecedents.[12]
>
> The theory that disease is due to a foreign body which must be sucked out is so widespread that [in Australia] it may date back to the earliest immigrants in Australia. But other parallels suggest merely an independent origin from like antecedents.[13]

By what magic Professor Lowie discovered these keys to age he does not reveal; but perhaps diviners should not be asked to give away the tricks of the trade. In 1936, A. M. Hocart attributes "remote antiquity" to an idea if it is "common to peoples of . . . widely different types of culture";[14] but this is not identical with the principle that geographic magnitude is an index of age.

No principle is better than the presupposition on which it rests; though it may be much worse. When we appeal to principles and to induction, we resort to logical procedures; this is none the less the case when we deal with ethnologic data than when we deal with other data in the universe of discourse. Certainly, in the long run, "the method by which a conclusion is reached is as important as the conclusion itself."[15] Indeed, in so far as ethnology scorns logic it is not science but mysticism or special pleading. A "principle" which is logically incorrect nevertheless sometimes yields correct results; but no principle, as something more than tested hypothesis, is established by merely asserting it. Until it is shown that an hypothesis corresponds with facts, it remains mere hypothesis. No one who has asserted the hypothesis that magnitude of distribution is an index of age has, so far as the present writer can discover, offered any evidence that it is true. Gomme, for example, adduces no evidence that this principle is true. He does not test it, he merely states it; and subsequent champions are content merely to assert that it is a valid principle of interpretation.

Kroeber says there are exceptions, but asserts that the hypothesis

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12 Robert H. Lowie, *An Introduction to Cultural Anthropology* (2nd ed., New York, 1940), p. 405.

13 *Ibid.*

14 A. M. Hocart, *Kings and Councillors* (Cairo, 1936), p. 227.

15 W. H. R. Rivers, *The History of Melanesian Society* (2 vols., Cambridge, 1914), vol. 2, p. 3.

is, in the main, true. He does not intimate the number, or the character, of the exceptions, or of the cases which conform. It seems, then, that the designation "principle" is a camouflaged misnomer; the proper designation is unverified and untested hypothesis. In the form in which its advocates use it, and with the data which they adduce, no one can say that it is true or that it is not true; or to what extent it is applicable. "Idle men that they are, that can say, this it is, and yet wee know it not: How long shall wee continue to bee ignorant in that which wee professe to have knowledge of?"[16] An hypothesis is established as a principle when we demonstrate that the data conform with the principle. Einstein's theory that light responds to gravitational pull remained an hypothesis until there was empirical confirmation. It then became a principle. That totemism is associated with exogamy is an hypothesis until there is empirical confirmation. That distribution is an index to the age of a trait is, until facts confirm it, only an hypothesis. I can think of three fields, and only three, in which it is possible to ascertain the relation between magnitude of distribution and age of the traits. (1) We can test it by archaeological data. For a given area, for several areas, and for the entire archaeological world, are the oldest forms revealed by archaeology the most widely spread? If this is sometimes the case, but not always so, in how many instances is it the case? Does the relationship differ with kind of materials? Is it the same at all prehistoric periods? (2) Is the hypothesis true of traits in the historic civilizations? Here, as often in the field of archaeology, we can assign known age to distribution and record the number of correspondences. (3) Is the hypothesis confirmed by the magnitude of distribution of traits which have arisen and spread in contemporary preliterate cultures during the period of observation, that is to say, where the relative age of the compared traits is known?

The techniques employed in inferring the past must meet the difficulties of verifications and the realities of historical phenomena if ethnology is to be concerned with culture history and not speculations about history.[17]

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16 Joseph Hall, *The Discovery of a New World* (1609).

17 Willard Z. Park, *Shamanism in Western North America: a Study in Cultural Relationships* (Northwestern University Studies in the Social Sciences, no. 2, Evanston and Chicago, 1938), p. 158.

> To prove anything in the sphere of social science we must hold ourselves to the task of a systematic investigation of concrete case material.[18]

I know no other method by which this hypothesis—or any other in ethnology—can be tested. We can not legitimately infer the relative age of traits by an hypothesis which assumes the very thing that must be proved. The users of the hypothesis proceed as follows: The hypothesis is true; therefore the facts can be marshalled in accordance with it; therefore it is true. The only assertions which I question in these three steps are the first and the last; but I do not conclude that therefore the hypothesis is one-third true. I have never heard of an hypothesis which will not permit the facts to be marshalled in the fashion presupposed by the hypothesis, provided one accept the hypothesis as an established principle. If the presumed relationship is reversed, and we assume that the least widely distributed traits are the oldest, the facts fit equally well. It merely remains to inquire whether the hypothesis is true. And some, it seems, do not wait for an answer to that inquiry. William Henry Welch once said: "If there is one pitfall to science more dangerous than another it is that of regarding hypotheses as proven facts."[19]

The essential character of this hypothesis is such that any principle which it could establish would have the characteristics which we call statistical; that is to say, the average result will occur in only a certain percentage of cases. To what extent, then, that is to say, in what percentage of cases, is it true? Is this percentage the same for all phases of culture—material culture, social life, language, plots in myths, religious rites, music, and others? Would this principle enable us to infer a specific past, granted that the percentages have been ascertained for respective phases of culture? Before we sail happily off to those ethnologic Isles of the Blest, so confidently pictured by reconstructionists—as though to misconstrue were to construct—let us deal a bit realistically with our world, even if our procedure offers no retreat from the hard facts of the ascertained. What would one think of the historian who declared he had surveyed the civilizations which flourished in Babylonia, Persia, India, Greece,

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18 H. G. Barnett, *Personal Conflicts and Cultural Change* (Journal of Social Forces, vol. 20, 1941), p. 171.

19 Simon Flexner and James T. Flexner, *William Henry Welch and the Heroic Age of American Medicine* (New York, 1941), p. 99.

Crete, China, and Japan, and would, on the basis of this information, infer the character of the civilization along the Nile? What would one think of the historian who asserted that he knew what happened in Egypt, century by century, from 3000 B. C. to 2000 B. C.; and moreover, he knew what happened there from 1000 B. C. to 100 B. C.; and on the basis of this knowledge, would infer what happened there from 2000 B. C. to 1000 B. C.? What would one think of the historian who reconstructed the history of a country on the basis of his knowledge of the history of other countries? Or, from the history of a dozen centuries of a given country inferred the culture phenomena of the next century, or of the century which preceded this period? If one knew the culture of each of ten thousand tribes of New World and Old, but knew nothing about Australia, would one, on the basis of this knowledge, be able to "predict," that is, to foresee, the culture of the Arunta of Central Australia? We may be interested in deriving laws from history, but I submit that we are not interested in inferring history from laws; we may be interested in obtaining generalizations from ethnographic data, but we are not, I submit, interested in inferring ethnographic data from ethnologic laws. In historic data, under which I include all ethnographic data that are actually data and not hypotheses, the data, "what actually happened," are our concern. Any historic data, and any ethnographic data, are, to some extent, unique; they cannot, in their particularity, be inferred. Often, when sufficiently relevant data are at command, we can infer the pattern of the culture; but never, it seems, the details of the culture. He who searches for historic reality will value humble fact above pretence. "Anthropology has become a historic study. It is not sufficient to know how such and such phenomena *may* have originated, but how, as a matter of fact, they did."[20] I prefer that sentiment to Lytton Strachey's "dreams are the stuff of history."[21]

If it has been established that in, let us say, ninety-eight per cent of the cases distribution is an index of age, the fact remains that we can not make so-called historical reconstruction on this basis; for the

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20 Arthur J. Evans, *"The Eastern Question" in Anthropology* (Report, British Association for the Advancement of Science, 1896), pp. 912-913.

21 Lytton Strachey, *Elizabeth and Essex* (New York, 1928; reprinted New York, 1939), ch. 2.

vital thing is, not to know that this is true in ninety-eight per cent of the cases, but to know that the case which we are pondering is in the group of ninety-eight per cent rather than in the group of the two per cent. The law of probability cannot tell us whether it is in the first group or is in the second. The statistician can predict the average life of a group of people each of whom is now aged forty; but he can not, as statistician, predict the actual but only the probable lifetime of a given individual; and a wise doctor can make a shrewder guess regarding the probable length of life of that individual. After identifying the languages of tribes in the great Central Woodland area one would be disposed to wager that the next tribe found there would be Algonkin; but, if that tribe happened to be the Winnebago, the guess would be wrong. A historian or an ethnographer is not so much impressed by the fact that the chances were nine out of ten that the Winnebago would be Algonkin; he is much more impressed with the fact that they are Siouian. Had he known that there would be an exception to this linguistic prevalence in the Central Woodland area, he could not have known that the exception would be the Winnebago rather than the Menomini—supposing, of course, that he did not know even the name of the tribe. If it is an *either-or* proposition, then, in the individual instance, prediction is entirely correct, or entirely wrong. One can, at best, ascertain merely the probability of the one rather than the other.

Boas, when discussing the methodology of the supposition that all geometric designs have been derived from realistic designs, refers to the circular procedure in the argument, but does not seem aware of the fact that he is using precisely such circular procedure when he assumes that a decorative design which is widely spread is older than one which has a more limited distribution. He assumes the conclusion which he professes to establish. He says:

> Looking at this matter from a purely theoretical point of view, it is quite obvious that in any series in which we have at one end a realistic figure and at the other end a conventional figure, the arrangement is due entirely to our judgment regarding similarities. If, without further proof, we interpret such a series as a genetic series, we simply substitute for the classificatory principle which has guided us in the arrangement of the series a new principle which has nothing to do with the principle of our classification.[22]

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22 *Decorative Designs of Alaskan Needle-Cases.*

Boas, however, makes precisely this substitution of "a new principle" for "the classificatory principle" when he assumes that magnitude of distribution is an index of age. Although he refers to archaeological evidence that the widely distributed design is old in certain areas of Eskimo culture, his argument relies not on archaeology, which, in this instance, for him, is merely supplementary, but on magnitude of distribution. The method of substitution is used in the very study in which he repudiates its legitimacy; his entire argument rests on such substitution. Yet previously he wrote:

> But it should be borne in mind that a theory must be true, and that its truth is the standard by which its value is measured. Therefore naturalists are always engaged in examining the truth of their theories by applying them to new phenomena, and in these researches those phenomena are the most important which seem to be opposed to the theories. . . . Every approach to truth is . . . a progress . . . superior to the most elaborate system which may give proof of a subtle mind and scrupulous thought.[23]

In a review of MacCurdy's *Chiriquian Antiquities* Boas indicates the fundamental error in the method of treating untested hypothesis as equivalent to established principle. MacCurdy, when interpreting historically undated art forms,

> selects [Boas says] the forms which seem most plausible as the starting point of the series and the rest are then arranged in order, a time sequence being substituted for a series based on similarities of form. It may be, that the investigator happens to strike the correct arrangement, but considering the complexity of the problem and the possibilities of development in various directions, the probability of having reached a true historical explanation is not very great. . . . They do not prove a historical development, because they are merely an enunciation of the principles of classification or seriation chosen by the student.[24]

This is precisely the basic criticism we make of the assumption that magnitude of distribution is an index of the age of a trait.

Frank H. H. Roberts, when discussing the Folsom complex, says:

> The generalized form has a much wider distribution than the others and, according to the concept that the larger the area covered, the older the form,

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23 Franz Boas, *The Study of Geography* (Science, vol. 9, pp. 137-141, 1887; reprinted in his *Race, Language and Culture*, New York, 1940, pp. 639-647), p. 644.

24 Franz Boas, *Review of MacCurdy, "Study of Chiriquian Antiquities"* (Science, n.s., vol. 34, pp. 442-446, 1911, pp. 442-443; reprinted in his *Race, Language and Culture*, New York, 1940, pp. 541-545), pp. 541-542.

would seem to antedate them. Yet it is far from certain that such was the case, and there are some indications that the reverse was true.[25]

W. D. Strong, in describing clans and moieties in southwestern California tribes, concludes that the more widely spread moiety division is the more recent phenomenon:

[a] dichotomy . . . superimposed on the localized lineage organization. . . . From the fact that an idea of dichtomy was more widespread in south and south central California, than was the priest, house, and fetish complex, it might be assumed that the moiety was of greater antiquity. However, the comparatively light impress of the moiety on the social structure in conjunction with the fact that it necessarily involves a number of groups, whereas the priest, house, and fetish complex is essentially local in nature, suggests that the idea of dichotomy was only one of several important concepts introduced into southwestern California at a very early time. . . . The ceremonial pattern of reciprocity that inclined intermarrying clans to officiate in a reciprocal manner at one another's ritualistic activities seems to have brought about the clan groupings most clearly recorded among the Serrano and Cupeño. In many ways this reciprocity appears more important as a social force in the groups under consideration than does nominal dichotomy and exogamy.[26]

Steward, also, points out that

so far as the Intermontane area and the Southwest afford an archeological check on ethnographic deductions based on the age-area concept, these elements [which characterize the marginal areas of North and South America, and so, by some, are assumed to be of considerable antiquity] appear to be surprisingly recent. Is it not possible that some of these elements developed as part of an early horticultural complex but spread beyond the limits of farming because they were useful in a variety of localities and that others even spread rapidly and recently from the far north or ultimately from Asia?[27]

Lowie says of the assumed relation between area and age:

This principle must be used with discrimination. No one supposes that there is a direct ratio between the area covered by a feature and its antiquity. All that is implied is a rough correspondence.[28]

Perhaps it would be out of bounds to describe this as "a mean-

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25 Frank H. H. Roberts, Jr., *Developments in the Problems of the North American Paleo-Indian* (Smithsonian Miscellaneous Collections, vol. 100, pp. 51-116, 1940), p. 56.

26 W. D. Strong, *Aboriginal Society in Southern California* (University of California Publications in American Archaeology and Ethnology, vol. 26, 1929), pp. 344-345; the order of these sentences has been changed from the original.

27 Julian H. Steward, *Native Cultures of the Intermontane (Great Basin) Area* (Smithsonian Miscellaneous Collections, vol. 100, pp. 445-502, 1940), p. 497.

28 Lowie, *An Introduction to Cultural Anthropology*, p. 367.

ingless answer to an impossible question raised by a gratuitous hypothesis"; it is certainly not a very meaningful answer to a gratuitous hypothesis. What kind of ratio is not a direct ratio? And what, specifically, is a rough correspondence? Does this mean that the correspondence applies in more than fifty per cent of cases? Or does less than fifty per cent constitute a rough correspondence? What, moreover, is the evidence for the indirectness of the ratio and the roughness of the correspondence?[29]

One is reminded of Basil H. Chamberlain's reference to the elaborate efforts of a German *savant,* one Dr Hoffman, to fix the hour of the accession of the first (mythic) Japanese emperor to the throne—the famous Jimmu Tenno—and Chamberlain's observation:

> much as if one should gravely compute in cubic inches the size of the pumpkin which Cinderella's fairy godmother turned into a coach and six. How comes it [Chamberlain asks] that profound erudition so often lacks the salt of humor and the guidance of common sense?[30]

In science, "being right is no excuse whatever for holding an opinion which has not been based on an adequate consideration of the facts involved in it."

Davidson has suggested that

> the hypothesis that the peoples of the world who possess the more simple cultures have been *driven* into isolated and peripheral regions by those with the more advanced cultures cannot be maintained as a general explanation of present ethnic or cultural distribution. Rather it would seem in general that the former once occupied the world at large and have been replaced or altered by the latter in all but certain peripheral and isolated areas.[31]

Driver calls attention to the fact that

> for the two Americas, Nordenskiöld has shown that the most striking similarities

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29 Possibly Lowie means that the ratio of ages of the traits is not necessarily identical with the ratio of the magnitudes of the areas of distribution of the respective traits; that is to say, that trait A is not necessarily twice the age of trait B, even if the magnitude of the area of A is twice the magnitude of the area of B. Or does he mean something different? Subsequently Lowie complained that Boas did not make clear his (Boas') position regarding the relation between age and distribution (Robert H. Lowie, *Franz Boas (1858-1942),* Journal of American Folklore, vol. 57, pp. 59-64, 1944, p. 64).

30 Basil H. Chamberlain, *Things Japanese* (London, 1905), p. 225.

31 D. S. Davidson, *The Relationship of Tasmanian and Australian Cultures* (Publications, Philadelphia Anthropological Society, vol. 1, pp. 47-62, 1937), p. 54.

are found between western North America, especially California, and South America, from the Chaco to Tierra del Fuego. These traits seem best explained as marginal survivals of an *Urkultur*. The higher cultural developments of Middle America, and migrations from north to south over the eastern parts of the two continents, plus probable diffusions in other directions, seem to have obliterated most if not all of the connecting links.[32]

In a paper on *Temporal Sequence and the Marginal Cultures*[33] Cooper, after rejecting the methods of distribution, complexity of trait, and lineal evolution, proposes another method of estimating sequence. This method analyses the total cultures of an area in which there are higher horticultural or agricultural tribes and marginal non-horticultural peoples. If marginal areas which are far separated from one another, for example, California and Tierra del Fuego, have in common many traits which are not found in the intervening horticultural regions, these common traits may be assumed to be persistences, tarriance, from an older culture which was once present throughout the total region. He reaches this conclusion by a rejection of other alternative explanations as less probable. The alternative explanations are: independent origins in the two areas, transmission from an outside source to the respective marginal regions, or diffusion from one marginal area to another after the higher cultures of the intervening regions had developed. Each alternative, he says, has a low degree of probability.

Granted the validity of these assumptions or principles, as outlined by Cooper, there remains the question of procedure in testing them, and the further matter of the results of the test. We must first decide whether, for example, we shall treat the New World as a geographic unit, when delimiting the marginal, or shall treat it as a region of differential culture levels, specifically, the horticultural and non-horticultural. Similarly for the Old World, or for any portion of New World or of Old World. If we employ culture levels, we should, it seems, when we record similarities in marginal cultures, take account of similarities in subareas within the intermediate

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32 Harold E. Driver, *Culture Element Distributions: XVI, Girls' Puberty Rites in Western North America* (Anthropological Records, University of California, vol. 6, no. 2, 1941), p. 61.

33 John M. Cooper, *Temporal Sequence and the Marginal Cultures* (Anthropological Series, Catholic University of America, no. 10, 1941).

higher cultures. The latter, in short, will serve as the controls of our experiment; and the utilization of them seems a necessary part of any critical program. Perhaps the matter will be clearer if we use the accompanying diagram (Figure 1).

The circle, or any outline, includes the total area investigated. A and B are widely separated marginal areas, non-horticultural, and the remainder of the region is horticultural (or agricultural). C, D, E, and F are subsidiary areas, remote from one another, within the horticultural area. To test the significance of the specific similarities between A and B we must, it seems, ascertain the number of traits common to A and B which are not present in intermediate areas, and compare the number of these similarities with the number of traits common only to paired regions, remote from one another, within the total area, that is to say, in E and D, E and C, E and F, D and C, D and F, F and C; or, in like manner, with whatever number of subsidiary areas we employ as controls.

I do not know how the subsidiary areas should be selected, other

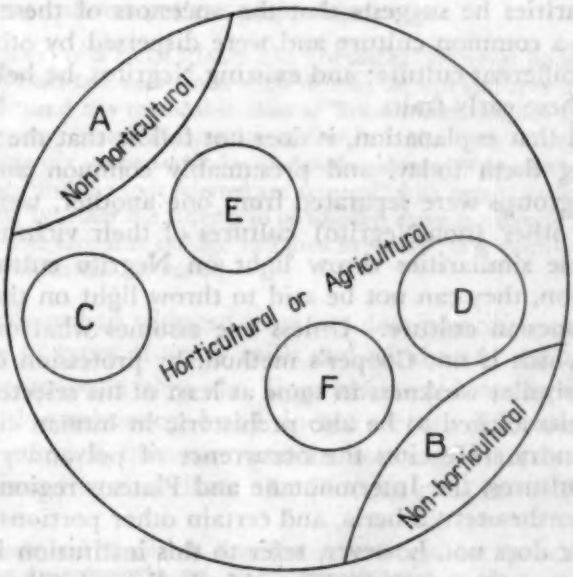

FIG. 1. Schematic total area. A and B, marginal areas; C, D, E, F, subareas of the higher cultures.

than at random. One might, I suppose, compare Northern Iroquois with Aztec, and Hidatsa with Natchez, contending as best one can with the handicap of absence of adequate information about traits. But only such comparisons, utilizing control groups, can, it appears, disclose the significance of the number of similarities between A and B. For the similar traits in E and F, for example, not found elsewhere in the horticultural area, and not an expression of or logically dependent upon the horticultural complex, might, for any evidence to the contrary, be as old as selected traits common only to A and B; particularly if certain other traits common to E and F, but not present elsewhere in the horticultural areas, are present also in B (and not in A), or also in A (and not in B).

Inasmuch as no "control" has been used by Cooper, in the paper above referred to, he has not, we believe, established his case. Much of the evidence adduced in his paper does not bear on the above mentioned problem. He indicates many resemblances in the culture traits of Negrito peoples in, respectively, the Andaman Islands, the Malay Peninsula, and the Philippine Islands. In explanation of these similarities he suggests that the ancestors of these respective groups had a common culture and were dispersed by other peoples who had a different culture; and existing Negritos, he believes, have preserved these early traits.

Granted that explanation, it does not follow that the traits common among them today, and presumably common among them before the groups were separated from one another, were common also to the other (non-Negrito) cultures of their vicinity. Hence, though these similarities throw light on Negrito cultures of the Asiatic region, they can not be said to throw light on the character of pre-Indonesian culture. Unless one assumes what one sets out to prove, which is not Cooper's method, by profession or practice. There is a similar weakness in some at least of his selected prehorticultural traits alleged to be also prehistoric in human culture, notably, polyandry. He cites the occurrence of polyandry in certain marginal cultures, the Intermontane and Plateau regions of North America, northeastern Siberia, and certain other portions of the Old World. He does not, however, refer to this institution in horticultural areas among ancient Arabs, and in India and Tibet; and these are formidable exceptions. Fundamentally, Cooper's principle seems

very much like that of Boyd Dawkins, Sollas, and others, who believed the Eskimo are continuators of Upper Paleolithic culture, and that (Sollas) Bushmen and Australians give other evidences of the character of European Paleolithic or Neolithic life; for Cooper seems to equate marginal with culture level, rather than, except by accident, with the geographically outermost. Possibly his hypothesis is correct; but he has not demonstrated that it probably is. He alleges "reasonable probability." The hypothesis is reasonable; but he has not demonstrated that it is probably valid. Neither has he disclosed what constitutes an unreasonable probability, or a reasonable one.

In an article published in the *American Anthropologist* in 1944 it is pointed out that various linguistic forms survive longer in lateral areas than in central areas, although, it is stated, "this norm does not apply when the central area happens to be an isolated one, as is Sardinia (Northern plus Southern Sardinia against Central);" and similar phenomena occur in Indo-European, Semitic, or Athabascan areas.[34]

The above quoted authors state that

> the rules or "laws" of a social science like linguistics can never hope to apply to each and every case: but, apart from a few details, the age and area hypothesis has been proved beyond any reasonable doubt. The authors can not agree with Dr Hodgen's suggestion that "the results achieved on the basis of customary geographical criteria cannot be verified with dated evidence,"[35] but feel that perhaps "the area chosen and the trait selected are atypical" with regard to the water mills and wind mills. Whether the latter is so or whether there is a flaw in Dr Hodgen's reasoning, we feel sure that the age and area hypothesis is a valuable tool of the social scientist which can be trusted.

If Dr Hodgen had adduced from her data regarding the distribution and age of types of water mills and wind mills the laws of linguistics, one suspects that the linguists would have viewed this inference with amazement; but I do not see any difference between the validity of such inference and its converse, namely, deducing social laws from linguistic laws. Dr Hodgen cites historic facts, and

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34 G. Bonfante and Thomas A. Sebeok, *Linguistics and the Age and Area Hypothesis* (American Anthropologist, vol. 46, pp. 382-386, 1944), p. 383.

35 *Ibid.*, p. 386. The reference is to Margaret T. Hodgen, *Geographical Diffusion as a Criterion of Age* (American Anthropologist, vol. 44, pp. 345-368, 1942).—W. D. W.

the above quoted linguists cite historic facts. It seems a bit perverse to suppose that one set of facts disproves another set of facts.

If Tommy is an Ainu and is tall, and Johnnie is an Ainu and is short, Tommy's existence does not disprove Johnnie's existence.

The linguistic facts which the authors above quoted adduce have no relevance to the distribution-age hypothesis.

They would be relevant, within the field of linguistics, if they demonstrated that the relative ages of Algonkin, Sioux, Zuñi, and Shoshonean are functions of their respective geographic distributions; or that Chinese, which is more widely spread than Japanese, is also older than Japanese.

If, however, such relationship prevails in language, it does not follow that the same relationship prevails in other fields of culture, in, for example, social organization. The issue is a question of fact: Does the relationship hold for each and every other phase of culture? And, if it holds, to what degree; that is to say, in what percentage of instances, is this the case? To disprove facts in technology by citing facts in linguistics is close to tilting at wind mills.

As Pascal said: "To make an hypothesis an evident truth, it is not enough that all the phenomena should follow." The law courts accept this principle and do not assume that a hypothesis is true merely because if you accept it all the marshalled facts fall into place. For which same, if we were the accused, we would have ample reason to be thankful. The propositions referred to above are not laws or principles in the sense that they are generalizations based on the observation of the known relationship of phenomena; rather they are legislated by their proponents; and such legislation is unprincipled.

> If it be asked why that society has the structure that it does have, the only possible answer would lie in its history. When the history is unrecorded . . . we can only indulge in conjecture, and conjecture gives us neither scientific nor historical knowledge.[36]

It is, moreover, important to distinguish between a generalization based upon ascertained facts, and the use of a well founded generalization to infer unascertained facts.

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36 A. R. Radcliffe-Brown, *On Joking Relationships* (Africa, vol. 13, pp. 195-210, 1940), p. 210.

The wise physician does not predict the symptoms of the patient. He ascertains them; and from the symptoms diagnoses the ailment. He does not consider acquaintance with disease equivalent to acquaintance with patient. A generalization does not enable one to predict the character of unascertained facts except in so far as one has already established the character of those facts. Statisticians refer to this principle as testing the reliability of the sample.

In the very nature of the case, this type of inference is, in the main, not applicable to historic or to ethnographic facts; if only because new facts constantly make new history and new ethnography. Perhaps no methodologic principle will tell us more about the unknown past than about the unknown future. In any case, it seems useful to observe a distinction between the mythic and the ascertained, and between the posited and the known. Otherwise we shall find it increasingly difficult to draw the line between science and myth; and it would be a pity to lose our myth through inability to identify it. I venture the guess that during the next century one of the puzzles of the future historian of anthropological doctrines will be that for half a century anthropologists, or some of them, cited a so-called principle of reconstruction of culture data without, meanwhile, any of them attempting to ascertain whether or not the cited doctrine was true.

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A

B

C

THREE CHIHUAHUA VESSELS: A and B show negative painting, C shows concentration of black near the rim.

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NEGATIVE PAINTING ON SOUTHWEST POTTERY

H. P. MERA

IN A RECENT PAPER on negative painted pottery by Willey and Philips[1] the following statement occurs: "It [negative painted pottery] avoids the Southwest completely, so that theories of derivation via that area, often invoked for Mexican traits in the Southeast, cannot be applied in this case." The first five words of this sentence offer a conclusion which appears to be debatable, dependent upon what territory is to be included in the Southwest. If the authors are referring only to those parts north of the Mexican boundary they are probably correct, but should the northwestern portion of the State of Chihuahua below that line be included, there is evidence at hand which appears to refute such a premise.

The occurrence of a hitherto undescribed ceramic form is somewhat surprising as the pottery types indigenous to northern Chihuahua have been subjected to a more or less detailed study by Kidder, Carey, Brand, and Sayles.[2] Of all these only Carey suggests the possible use of some resistant substance to obtain a negative effect in ceramic decoration. His description, however, leaves no doubt that his surmise as to the use of the method discussed by Willey and Phillips was in error.

Despite the failure of any of these authorities to recognize any examples of the so-called negative painting technique, there are two jars, apparently of this class, in the Chihuahua collection of the Laboratory of Anthropology (Plate 1, A and B). A third (Plate 1, C) demonstrates a partial use of the method. In addition, a sherd showing rim blackening, similar to one illustrated by Sayles,[3] as well as having a trace of what may be negative painting, was collected at a site in southernmost New Mexico which contained a large percentage of material intrusive from Chihuahua. All the examples just cited appear to be variants, perhaps subtypes, of Sayles'[4] Playas Red

1 Willey and Phillips, 1944, p. 183.
2 Kidder, 1916; Carey, 1931; Brand, 1935; Sayles, 1936.
3 Sayles, 1936, Plate 7.
4 *Op. cit.*, p. 31.

type. Although there is no question but that the three Laboratory vessels came from sites in northwestern Chihuahua, the possibility of their being intrusive into that area can not be entirely overlooked. On the other hand, they do not fit the descriptions of known ceramic types from any other section, except for the technique employed in decoration. There are two logical reasons which can be advanced to explain why this new variety has previously escaped detection.

First, it may be recalled that practically all of the Chihuahua collections to be seen in museums represent an exploitation of ruins by native laborers who hoped by sales of the objects recovered to augment, at best, a precarious livelihood. When the average collection is critically examined, it will be at once seen that it is comprised for the most part of showy pieces. The digger, with an eye on salability, probably made little effort to save anything he considered to be in the least way unmarketable. In this category would come negative painted jars with their less positive patterning. Again, because most of the whole pieces of pottery available to the student were of this specialized class, dependence has had to be placed largely on sherds in most of the studies made up to the present time. Because of such limitations, it is quite likely that, due to the indistinct smudgy character of most negative painting, many fragments bearing only portions of designs would have been confused with those on which "firing clouds" appear (a form of accidental smudging frequently occurring on Southwestern wares) and thus passed unrecognized.

The three jars illustrated here were selected from among the remnants of a once large collection brought together by a man with extensive business interests in Chihuahua, the more ornamental pieces having been previously disposed of to purchasers with an eye to artistic merit alone.

On first thought, the provisionally applied term "resist-smudged" appeared to be an appropriate name for this variety. This was based on the supposition that it represented a phase in the art of producing a deposit of carbon on ceramic surfaces, a common practice in many parts of the Southwest from about the fifth century. Guthe[5] describes the process of smudging as it is used in modern times, which prob-

5 Guthe, 1925.

ably does not differ in principle from that in use in past centuries.

Later the question arose as to the probable mechanics involved in arriving at the differing effects produced on the three vessels, which are otherwise of the same general type. Although the negative spaces on the jar figured on Plate 1B might conceivably have been stopped out and the whole vessel subjected to smudging, those on Plate 1, A and C—the first and the latter without negative designs—have only the upper parts blackened, with little in the way of a definite line of demarcation at the bottom to indicate that any resistive substance had once been applied over the underbody to keep it from discoloring. The upper darkened portions in both cases tend to shade off into the red of the lower part. Another feature deserving of notice is that in all jars seen, including the one illustrated by Sayles, the black increases in density toward the rim.

It was not until Lothrop's[6] remarks on the negative painted wares of Middle and South America were consulted that some idea was gained which tended toward a possible solution. In substance, his explanation of the technique calls for the primary application to a vessel of a resistive medium, such as wax, followed by the use of a dye. When the wax and excess dye were removed, an undyed negative pattern would be found beneath the waxed areas. There are certain aspects of the Chihuahua specimens that suggest a similar procedure to that just outlined. In the first place they show none of the dense black characteristic of another common Chihuahuan type, Ramos Black, which Sayles[7] properly classes as a true smudged ware. He also states that a black pigment was applied in some instances to give an added depth of tone. This latter statement is probably erroneous because it has been found that pottery slipped with red, when smudged, attains a deeper black than that left unslipped.[8]

As Sayles intimates that a very close relationship exists between his Ramos Black and Playas Red types, except in color, it is very likely that the former is a smudged variety of the latter and that no pigment was involved. With this in mind, the unusually faded quality of the blacks appearing on the negative painted pieces, basi-

6 Lothrop, 1936, p. 9.
7 Sayles, 1936, pp. 43-44.
8 Mera, 1939, p. 14.

cally a Playas Red type of pottery, tends to support the view that some method other than ordinary smudging was employed, probably a use of some coloring matter in a rather dilute form.

A previously mentioned feature, which seems to corroborate the utilization of some medium in a fluid state, is the marked concentration of pigment in the neighborhood of the rims, as if, after dipping, the jars had been held mouths downward while draining off the excess. A little longer time would thus be allowed for contact of the coloring agent with those parts.

With no intent to imply specifically a use by the prehistoric Chihuahua artisan, it can be pointed out that there are at least two water-soluble substances capable of producing a carbon black when fired. One, favored by most of the eastern Pueblos for painting designs on pottery, is a resinous-like material secured by boiling down the stems of the Rocky Mountain Beeweed (*Cleome serrulata* Pursh), while the present-day Maricopa prefer a decoction of the charred bark of the mesquite (*Prosopis glandulosa* Torr) for a like purpose. Either of these substances, if diluted sufficiently for a bath in which pottery could be dipped, presumably might yield a rather characterless black on firing.

Lest it be thought that a smudged black and the faded variety just discussed were all that were available to the Chihuahua potter, it may be well to mention that a dense black paint for design work was habitually used on a number of other pottery types indigenous to this ceramic province. Among these was a variety having a red slip, Madera Black-on-red.[9] In the light of this, it is most puzzling to find that a method, entirely foreign to what appears to be an overwhelming majority of Chihuahuan patterned wares should occur at all. Perhaps these three aberrant examples may be viewed as the result of an introduction of a borrowed idea which in practice never became fully established, or they may possibly have been intrusives from a less known area where negative painting might have been in vogue.

Although the accompanying plate illustrates the several examples to a fairly satisfactory degree, yet, owing to limitations of photography, the exact relationship of the reds to the blacks is not quite

9 Sayles, 1936, p. 23.

correctly represented. Specimen A is the best in this respect. In the next, B, an unslipped example, the degree of blackness appears slightly exaggerated, probably due to a highly polished surface. A wide band of red paint has been used to fill in nearly all of the negative areas. The blackening on C, while comparatively weak on the original, is more distinct than shown in the illustration. Blackening is most intense about the rim and disappears a short distance above the knobs. There is no negative design.

In conclusion the writer wishes to venture a protest against the use of the term "negative painting" to describe the method discussed herein or similar methods. This is because it can apply equally to negative designs arrived at by other means, thus leading to confusion. "Resist-dying" is already recognized as a proper designation for a like process in the textile field. "Resist-painting" or some such name would leave no question regarding the technique necessary to the creation of this particular type of design.

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